PROCEEDINGS
OF THE
MEDICAL EDUCATION CONFERENCE

1955

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The Medical Education Conference, Ministry of Health, Government of India

GOVERNMENT OF INDIA.

Proceedings

OF THE

Medical Education Conference

HELD

UNDER THE AUSPICES OF THE

MINISTRY OF HEALTH, GOVERNMENT OF INDIA, NEW DELHI

19th-22nd November, 1955

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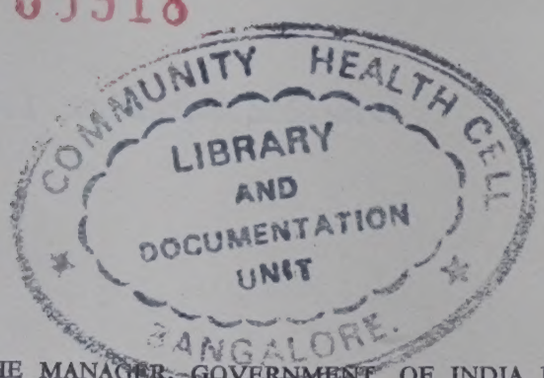

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PREFACE

As rapporteurs of the Conference we would like to indicate how the proceedings of the Conference are reported in this volume. As will be seen in the Chapter on the Genesis and Organisation of the Conference, working papers on the various aspects of medical education were prepared beforehand by the three Sub-Committees and their associated Study Groups and circulated to the delegates. These papers formed the basis for initiating discussion at the Conference. They are presented in the appendices. At the Conference no formal presentations on any subject were invited from the participants. All the subjects selected for discussion were considered in Plenary Sessions.

The proceedings of the Plenary Sessions of the Conference are presented in Chapters III to XII. Each Chapter begins with a brief resume of the working paper on the subject and of the trends in the discussion at the Conference as prepared by us, followed by the relevant resolution adopted by the Conference. After this is given an abstract of the discussion that took place in the order in which the delegates spoke. The abstract is based on the stenographic record of the discussion and on the summaries of the observations kindly supplied to us, at our request, by individual participants. In preparing the abstract, care was taken to see that all points made by the speakers, which were relevant to the discussion, were included. As far as possible, the language and style of the participants were preserved.

Chapter XII deals with the concluding Plenary Session of the Conference, when formal resolutions were introduced for adoption by the Conference on the basis of the discussions on the preceding days. Although the resolutions are cited at their appropriate places in the respective chapters, they are all brought together in one place in Appendix I to the proceedings for convenience of reference. At the concluding session, representatives of international organisations and observers from foreign countries addressed the Conference. Their speeches are reproduced at the end of the Chapter.

We would like to take this opportunity of expressing our appreciation of the valuable help given by Dr. V. Ramalingaswami, Deputy Director of the Indian Council of Medical Research, in the preparation of this volume.

C. G. PANDIT,
Director, Indian Council of Medical Research
and
K. C. K. E. RAJA,
Secretary, Committee of the All-India Institute of Medical Sciences.

New Delhi.

TIME-TABLE

OF THE

CONFERENCE

Venue :—CENTRAL HALL, LOK SABHA

19th November, 1955

TUBERCULOSIS ASSOCIATION BUILDING

RED CROSS ROAD

20th-22nd November, 1955.

INAUGURAL SESSION

SATURDAY, 19TH NOVEMBER

10 a.m.—1 p.m.

Chairman: Rajkumari Amrit Kaur

Opening remarks of welcome—Chairman.

Speech—Prime Minister.

Inaugural Address—Dr. B. C. Roy.

Vote of thanks—Lt.-Col. C. K. Lakshmanan.

PLENARY SESSION

2-30—5-30 p.m.

Chairman: Dr. B. C. Roy.

Premedical studies and Entrance Requirements.

Selection of Students.

PLENARY SESSION

SUNDAY, 20TH NOVEMBER

10 a.m.—1 p.m.

Chairman: Dr. B. C. Roy.

Curriculum Hours.

Subjects needing special emphasis:—

Preventive and Social Medicine, Paediartrics, Psychological Medicine, Post-Mortems, Libraries and Museums.

PLENARY SESSION

2-30—5-30 p.m.

Teaching Methods:—
Didactic, Practical, Integrated Teaching, Internships.

PLENARY SESSION

MONDAY, 21ST NOVEMBER

10 a.m.—1 p.m.

Chairman: Lt.-Col. C. K. Lakshmanan.
Examinations or Assessment.

2-30—5-30 p.m.

Selection of teachers.
Conditions of appointment.
Full-time principal.
Elective time.
Association of Medical Colleges.

PLENARY SESSION

TUESDAY, 22ND NOVEMBER

10 a.m.—1 p.m.

Chairman: Lt.-Col. C. K. Lakshmanan.
Consideration of Resolutions.
Speeches by Representatives of International Organizations and foreign delegates.

LIST OF DELEGATES AND OBSERVERS

1. Achar, S. T., Dr., Paediatrician, Madras Medical College, Madras.
2. Aiman, R. (Mrs.), Dr., Dean, Faculty of Medicine, University of Poona, Poona.
3. Amir Chand, Lt.-Col., 12, Curzon Road, New Delhi.
4. Anand, B. K., Dr., Lady Hardinge Medical College, New Delhi.
5. Ananthachari, M. D., Dr., Principal, Madurai Medical College, Madurai.
6. Appajee, Y., Dr., Principal, Medical College, Mysore.
7. Ayer, A. A., Dr., Director and Professor of Anatomy, Institute of Anatomy, Stanley Medical College, Madras.
8. Banerji, B. N., Dr., Principal, Darbhanga Medical College, Laherisarai.
9. Banerji, T. N., Dr., Sir Ali Road, Patna.
10. Barva, G., Dr., Principal, B. J. Medical College, Ahmedabad.
11. Barua, H. C., Dr., Principal, Assam Medical College, Dibrugarh.
12. Bhat, H. N., Dr., Principal, S. N. Medical College, Agra.
13. Bose, B. C., Dr., Principal, M. G. M. Medical College, Indore.
14. Carmen, J. S., Dr., Director, Christian Medical College and Hospital, Vellore.
15. Chaudhury, B., Lt.-Genl., Director-General, A. F. M. S., Ministry of Defence, New Delhi.
16. Chaudhury, R. N., Dr., Director, School of Tropical Medicine, Calcutta.
17. Chakravarti, D. N., Lt.-Genl., Secretary & Director of Health Services, Govt. of West Bengal, Calcutta.
18. Chakravarti, M. L., Dr., Professor of Physiology, Medical College, Calcutta.
19. Chandy, J., Dr., Associate Professor of Neurology and Neuro-surgery, Christian Medical College, Vellore.
20. Chopra, A. N., Dr., Director of Medical and Health Services, Lucknow.
21. Craig, M. (Miss), Principal, College of Nursing, 12, Jaswant Singh Road, New Delhi.
22. Das, S. C., Dr., Principal, Sriram Chandra Bhanj Medical College, Cuttack.
23. Das Gupta, S. N., Dr., Professor and Head of Botany, Lucknow University, Lucknow.
24. Dutt Gupta, A. K., Dr., Principal, Nilratan Sircar Medical College, Calcutta.
25. DeQuadros, A. N., Dr., Principal, Medical College, Baroda.
26. Desai, B. M., Dr., Principal, B. J. Medical College, Poona.
27. Dhall, S. R., Dr., 34, The Mall Road, Amritsar.
28. Dikshit, B. B., Dr., Surgeon General with the Government of Bombay, Bombay.
29. Dutta, P. C., Lt.-Col., Principal, Government Medical College, Patiala. (Present Address:—Sector No. 7, Plot No. 7, Chandigarh.)
30. Gharpure, P. V., Dr., Retired, Prof. of Pathology, Grant Medical College, Bombay.
31. Govindaswamy, M. V., Dr., Director, All India Institute of Mental Health, Bangalore.
32. Grewal, K. S., Dr., Professor of Pharmacology, Govt. Medical College and Superintendent, Rajindra Hospital, Patiala.
33. Gujral, M. L., Dr., Professor of Pharmacology, K. G. Medical College, Lucknow.
34. Jain, S. P., Dr., Prof. of Anatomy, Medical College, Agra.
35. Karande, J. N., Dr., Lecturer in Obstetrics & Gynaecology, Topiwala National Medical College, Bombay.
36. Karandikar, G. K., Dr., Prof. of Pharmacology, Baroda Medical College, Baroda.

37. Karunakaran, C. O., Dr., Senior Vice-President, Indian Medical Association, "Leena Vilas", Kunnukuzhi, Trivandrum (Travancore-Cochin).
38. Kasliwal, R. M., Dr., Principal, S. M. S. Medical College, Jaipur.
39. Khanolkar, V. R., Dr., Director, Tata Memorial Hospital, Parel, Bombay.
40. Khatri, L. D., Dr., Director of Medical & Health Services, Hyderabad.
41. Khurana, B. D., Brig., Principal, Armed Forces Medical College, Poona.
42. Krishnan, K. V., Dr., Director, All India Institute of Hygiene and Public Health, Calcutta.
43. Kurulkar, G. M., Dr., Prof. of Anatomy, G. S. Medical College, Bombay.
44. Kutumbiah, P., Dr., Principal, Christian Medical College, Vellore.
45. Lakshmanan, C. K., Lt.-Col., Director-General of Health Services, New Delhi.
46. Mangalik, V. S., Dr., Dean, King George's Medical College, Lucknow.
47. Mangesh Rao, N., Dr., Dean, Kasturba Medical College, Manipal (S. I.).
48. Mathur, S. N., Dr., 9, University Road, Lucknow.
49. Mehta, S. J., Dr., Sindhula Gamadia Road, Bombay-26.
50. Mehta, Jivraj N., Dr., Minister for Finance, Govt. of Bombay, Bombay.
51. Melkote, G. S., Dr., P. W. D. & Labour Minister, Govt. of Hyderabad, Madina Bagh, Hyderabad.
52. Menon, S. K., Dr., 21-A, Nizamuddin West, New Delhi.
53. Mirajkar, Lt.-Col., 87, Golf Link, New Delhi.
54. Misra, K. N., Dr., Iccha Nivas, P.O. Bhubneshwar, Puri (Orissa).
55. Mitra, Subodh, Dr., 4, Chowringhee Terrace, Calcutta-20.
56. Monteiro, L., Dr., Dean, Topiwala National Medical College, Bombay.
57. Nair, R. Kesvan, Dr., Superintendent, General Hospital, Trivandrum.
58. Nambiar, P. C., Dr., Dean, Faculty of Medicine, Gauhati University, Assam Medical College, Dibrugarh.
59. Narayana, B., Dr., Vice-Chancellor, Patna University, Patna.
60. Nath, D. P., Lt.-Col., Director of Health Services, Bihar, Patna.
61. Nigam, R., Dr., Prof. of Surgery, Medical College, Nagpur.
62. Padmavati, S. (Miss), Dr., Lady Hardinge Medical College, New Delhi.
63. Pan, M., Dr., Principal, Calcutta National Medical Institute, Calcutta.
64. Pandit, C. G., Dr. Director, Indian Council of Medical Research, New Delhi.
65. Pandit, M. K., Dr., Principal, Osmania Medical College, Hyderabad.
66. Paranjpe, A. S., Dr., Prof. of Pharmacology, Medical College, Gwalior.
67. Patel, C. S., Dr., President, Medical Council of India, Backbay View, 3, New Queens Road, Bombay-4.
68. Patel, M. D., Dr., "Moti Ganga", Ambawadi, Ellis Bridge, Ahmedabad-6.
69. Pathak, L. V. (Miss), Dr., Prof. of Obstetrics, G. R. Medical College, Gwalior.
70. Patwardhan, V. N., Dr., Director, Nutrition Research Laboratories, Coonoor (S. I.).
71. Pishorati, K. N., Dr., Principal, Stanley Medical College, Madras.
72. Pohowalla, J. N., Dr., Reader in Paediatrics, M. G. M. Medical College, Indore.
73. Prasad Rao, C. K., Dr., Dean, Madras Medical College, Madras.
74. Ram, D., Dr., Principal, P. W. Medical College, Patna.
75. Ramanamurthy, M. V., Dr., Principal, Kasturba Medical College, Mangalore.
76. Raman, T. K., Dr., Principal, Medical College, Trivandrum.
77. Raghavachari, C., Dr., Professor of Surgery, Stanley Medical College, Madras.
78. Raja, K. C. K. E., Dr., Ministry of Health, New Delhi.

79. Rakshit, P. C., Dr., Principal, Seth Meghaji Pethraj Medical College, Jamnagar.
80. Rao, B. N. B., Dr., Principal, G. R. Medical College, Gwalior.
81. Rao, K. N., Major, Director of Health Services, Andhra State, Madras.
82. Reddy, D. G., Dr., Principal, Andhra Medical College, Visakhapatnam.
83. Reddy, D. Jagannadha, Dr., Principal, Guntur Medical College, Guntur.
84. Roy, B. C., Dr., Chief Minister, West Bengal, Calcutta.
85. Roy Chaudhury, A. K., Dr., Principal, R. G. Kar Medical College, 1, Belgachia Road, Calcutta.
86. Saigal, K. R., Maj.-Gen., D. M. S., Army Headquarters, New Delhi.
87. Sangam Lal, Lt.-Col., Director of Medical Services, Madras.
88. Sanjiv, K. S., Dr., Professor of Medicine, Medical College, Madras.
89. Sarkar, M. N., Dr., Principal, Calcutta Medical College, Calcutta.
90. Sen, S. C., Dr., President, Indian Medical Association, 1, Barakhamba Road, New Delhi.
91. Sethna, D. P., Dr., Principal, Grant Medical College, Bombay.
92. Shahani, T. D., Dr., Director of Health Services, Madhya Pradesh, Nagpur.
93. Sharma, G. L., Dr., Principal, Medical College, Nagpur.
94. Sinha, S. C., Dr., Principal, Medical College, Bhopal.
95. Sircar, B. N., Dr., Seth G. S. Medical College, Parel, Bombay.
96. Snow, E. P. B., Dr., Principal, Christian Medical College, Ludhiana.
97. Subbareddy, D. V., Dr., Professor of Physiology, Madras Medical College and Secretary, Indian Association of History of Medicine, Madras.
98. Swift, H. B. N., Dr., Principal, Lady Hardinge Medical College, New Delhi.
99. Tampi, N. K., Dr., Professor of Preventive Medicine, Medical College, Trivandrum.
100. Taylor, C. E., Dr., Professor of Preventive Medicine & Public Health, Christian Medical College, Ludhiana.
101. Taylor, F. (Miss), Dean, School of Nursing, Christian Medical College & Hospital, Vellore.
102. Thangavelu, M., Dr., Professor of Pathology, Medical College, Trivandrum.
103. Tribedi, B. P., Dr., Retired Professor of Pathology, Medical College, 11/1, Kyd Street, Calcutta-16.
104. Tulsidas, Dr., Professor of Ophthalmology, Medical College, Amritsar.
105. Ukil, A. C., Dr., 67, Dharamtalla Street, Calcutta.
106. Vahia, N. S., Dr., Seth G. S. Medical College, Parel, Bombay.
107. Vengsarkar, S. G., Dr., Dean, Seth G. S. Medical College, Parel, Bombay.
108. Viswanathan, R., Dr., Deputy Director-General of Health Services, New Delhi.
109. Wahi, P. N., Dr., Professor of Pathology, Medical College, Agra.
110. Wig, K. L., Dr., Principal, Medical College, Amritsar.
111. Yodh, B. B., Dr., Physician, J. J. Hospital, Bombay.

OBSERVERS

South East Asian Countries

Burma

1. Dr. Ba Than, Dean, Medical Faculty, University of Rangoon, Rangoon.
2. Dr. Min Sein, Professor of Medicine, Rangoon Medical College, Rangoon.

Ceylon

1. Sir Nicholas Attygalle, Vice-Chancellor, Colombo University, Colombo.
2. Prof. O. E. R. Abhayaratne, Dean, Medical Faculty, Colombo University, Colombo.

China

1. Dr. Ko Lin, President, South China Medical College.
2. Dr. Hu Chuan-kuei, President, Peking Medical College.
3. Dr. Wu Chih-chung, Dean, China Medical University.
4. Dr. Chang Weihsun, Deputy Director, Foreign Relations Office, Ministry of Public Health.
5. Dr. Chi Cheng-huan, Vice-President, Hunan Medical College.

Indonesia

1. Prof. Soetarman, Dean, Medical Faculty, University of Djakarta, Djakarta.
2. Prof. Bambang Soetarso, Medical Faculty, Togjakarta.
3. Prof. Wahab, Dean, Medical Faculty, Surabaya.
4. Prof. Ahmed Sofian, Dean, Medical Faculty, Medan.

Thailand

1. Prof. Luang Binbakya Bidyabhed, Dean, Siriraj Medical School, Bangkok.
2. Prof. Banyen Davibhadhana, Head, Department of Anatomy, Chulalongkorn Medical School, Bangkok.

Rockefeller Foundation

1. Dr. Allan Gregg.
2. Dr. M. C. Balfour.
3. Dr. R. K. Anderson.

Technical Co-operation Mission

1. Dr. John C. Hume.
2. Dr. E. J. Anderson.
3. Dr. H. Smetana.

World Health Organisation

1. Dr. C. Mani, Regional Director.
2. Dr. M. R. Sacks, Area Representative for India.
3. Dr. J. M. Vine, Director of Health Services.
4. Dr. E. Graegorzewski.

CHAPTER I

The Genesis and Organisation of the Conference

INTRODUCTION

"Between the young graduate in medicine and his ultimate responsibility—human life—nothing interposes. The issues of life and death are all in the day's work for him. From the very first the training of the doctor is, therefore, much more complex and more directly momentous than that of the technician." This statement by Abraham Flexner conveys more directly than any other the challenge of medical education. The teaching of traditional disciplines of medicine, such as anatomy and physiology, medicine and surgery, is itself exposed to considerable stress with the rapid advances in medicine and the ever increasing number of specialities. The increasing dependence of medicine upon the basic sciences of physics, chemistry and biology requires a broadening of the content of medical education to include these subjects. And yet medical education cannot be divorced from the study of humanities, literature, history, philosophy and arts. To blend all these requirements into a unified system of medical education is the need of the hour.

There is always a wide gap between the ideal and the practical. Medical education is expensive and the nearer it approaches the ideal the more expensive it becomes. Medical education has therefore to be related both to the resources that are available and to the needs of the country. It has to be cast within the framework of the general educational system in the country. All these adjustments require careful thought and planning. The Conference on Medical Education convened by the Government of India in November, 1955, was intended to serve the purpose of critically examining the existing systems of pre-medical and medical education, of laying down the objectives to be achieved and of suggesting the steps necessary to promote the attainment of those objectives.

Genesis of the Conference

The Conference on Medical Education, which took place in November, 1955, marks an important stage in the programme of action undertaken by the Central and State Governments, during the previous eight or nine years, for the improvement of medical education in India. Ever since India gained independence in 1947 the problem of raising the standard of professional training for different types of health workers and of expanding facilities for such training has been receiving continuous attention.

A statutory body, the Medical Council of India, was created by an Act of the Central Legislature as far back as 1933 to promote uniform and improved standards of medical education in the country. Not long after the transfer of power took place, three other enactments were made by Parliament, the Indian Nursing Council Act, the Dentists' Act and the Pharmacy Council Act, which created Nursing, Dental and Pharmacy Councils with powers and functions similar to those of the Medical Council of India.

In the field of medical education, with which this report is concerned, special reference may be made to an Upgrading Scheme whereby selected departments in individual medical colleges are being improved in order to provide post-graduate training facilities of a high standard for students from all parts of the country. In the All-India Institute of Hygiene and Public Health at Calcutta a new project for the training of maternal and child health workers has been developed with assistance from UNICEF and WHO ; the facilities created there are available not only for students from India but also for trainees from other Asian countries. With generous assistance from the Government of New Zealand to the extent of a million pounds, an All-India Institute of Medical Sciences is being developed in New Delhi in order to provide, at one place, under graduate and post-graduate medical training of a high order in all the major subjects. One of the main purposes of the Institute is to train teachers for medical colleges in the country.

Other schemes include generous grants, under the Five Year Plans, for improving and modernising the equipment of medical colleges, for the establishment of full-time units, with prohibition of private practice, in all departments of medical colleges in the country and for a scholarship scheme whereby junior teachers are helped to take post-graduate qualifications in their special subjects and to carry out, at the same time, a prescribed piece of research.

The number of medical colleges has also increased appreciably during the past eight or nine years. Within the territory now known as the Indian Union there were in 1946, 16 medical colleges and 17 medical schools. Of the latter most have been converted into colleges and others were discontinued. Today there are 42 medical colleges. Six are proposed for establishment during the period of the second Five Year Plan.

The brief reference to the developments in medical education that have taken place during the past several years has been made here in order to show that the Medical Education Conference came not as an isolated incident but as part of a planned scheme of action to improve medical education. New medical colleges are being established in different parts of India and the All-India Institute of Medical Sciences is being created with its powers and functions designed to facilitate the prosecution of experimental studies in medical education. It was, therefore, considered desirable that the system of medical education in India should be examined critically by the best available

talent in that field. The need was felt for a reorientation of medical education in relation to the newer development taking place elsewhere and also in relation to the special needs of the country.

The Rockefeller Foundation, which has collaborated with the Governments in India during many years in promoting various developments in the field of health including medical education, invited a small body of medical educationists and some others interested in the subject to an informal meeting at Bangalore on 31st May and 1st June, 1954, for the purpose of discussing the question of holding a conference to deal with the problems associated with medical education in India. This meeting expressed the view that it was desirable and necessary to hold a conference on medical education on an All-India basis and suggested that its deliberations might be confined to under-graduate medical education. The recommendation was also made that teachers, research workers and administrators closely associated with the development of medical education should be invited to participate in the proposed conference.

Organisation of the Conference :

These recommendations, when received by the Government of India, were accepted whole-heartedly by that Government. In order to promote the organisation of the Conference the Government appointed a Policy Committee with the following composition :

1. Director-General of Health Services,
2. Dr. C. G. Pandit and
3. Dr. K. C. K. E. Raja.

Dr. M. C. Balfour, Representative of the Rockefeller Foundation in India, was co-opted to the Committee as an observer.

This Committee, after taking into consideration the discussion at the Bangalore meeting, decided that comprehensive memoranda on different aspects of medical education should be prepared which would form the basis for discussion at the Conference. For this purpose it established three Sub-Committees, each of which being assigned a particular area of the total field of under-graduate medical education. The Policy Committee appointed a Chairman for each of the Sub-Committees and, in consultation with them, settled the composition of these bodies. The composition and the subjects assigned to them are shown below :—

SUB-COMMITTEE NO. I

Composition	*Subjects.*
1. Dr. V. S. Mangalik (Chairman) Dean, Medical College, Lucknow.	
2. Dr. A. A. Iyer, Director and Professor of Anatomy, Staneley Medical College, Madras.	(*a*) Pre-medical studies. (*b*) Entrance requirements.

3. Dr. R. Viswanathan, Deputy Director General (Medical) Directorate General of Health Services, New Delhi.

4. Dr. S. N. Das Gupta, Professor of Botany & Dean, Faculty of Sciences, Lucknow.

5. Dr. J. S. Carman, Christian Medical College, Vellore

(*c*) Selection of students.

SUB-COMMITTEE NO. II

Composition

1. Dr. S. C. Vengsarkar (Chairman), Dean, Seth G. S. Medical College & K. E. M. Hospital, Bombay.

2. Dr. A. N. DeQuadros, Principal, Medical College, Baroda.

3. Dr. B. B. Yodh, Physician, J. J. Hospital, Bombay.

4. Dr. C. M. Kurulkar, Professor of Anatomy, Seth G. S. Medical College, Bombay.

5. Dr. Tribedi, Retd. Professor of Pathology, Medical College, Calcutta.

6. Dr. Carl Taylor, Professor of Preventive Medicine and Public Health, Medical College, Ludhiana.

7. Dr. S. T. Achar, Paediatrician, Madras Medical College, Madras.

Subjects.

(*a*) Curriculum hours—pre-clinical, clinical.

(*b*) Methods of teaching, didactic and practical—integrated teaching of clinical and pre-clinical subjects.

(*c*) Subjects needing special emphasis, *e.g.*, Preventive and Social Medicine, Paediatrics, Psychiatry, Biostatistics and rural field experience.

(*d*) Internship.

In view of the importance and complexity of the subject of integrated teaching a special Study Group was formed by Sub-Committee II to discuss and put forward concrete suggestions for consideration. Dr. B. B. Yodh was made the Chairman of this Study Group and the following were made the members of it :—

Anatomy	.Dr. S. P. Jain, Professor of Anatomy, Medical College, Agra.
Physiology & Biochemistry . .	Dr. B. K. Anand, Professor of Physiology, Lady Hardinge Medical College, New Delhi.
Pharmacology	Dr. G. K. Karandikar, Professor of Pharmacology, Medical College, Baroda.
Pathology	Dr. P. N. Wahi, Professor of Pathology, Medical College, Agra

Paediatrics	Dr. S. T. Achar, Professor of Paediatrics, Medical College, Madras.
Preventive Medicine . . .	Dr. Carl Taylor, Professor of Preventive Medicine and Public Health, Medical College, Ludhina.
Surgery	Dr. S. K. Menon, till recently Principal, Medical College, Jaipur.

SUB-COMMITTEE NO. III

Composition	*Subjects.*
1. Dr. M. N. Sircar (Chairman), Dean, Calcutta Medical College, Calcutta.	
2. Dr. P. V. Gharpure, Emeritus Professor of Pathology, Grant Medical College, Bombay.	
3. Dr. C. Raghavachari, Professor of Surgery, Stanley Medical College, Madras.	Examinations.
4. Dr. K. L. Wig, Principal, Medical College, Amritsar.	

On the 19th and 20th of September the members of the three Sub-Committees and the Policy Committee assembled in New Delhi and discussed the reports prepared by the three bodies with a view to the evolving of agreement, as far as may be possible, on the more important subjects covered by the reports.

The main ideas that emerged as the result of the discussion that took place on these two days were brought together in a memorandum which was submitted to the Conference. The documents made available to the Conference were :—

Document No.	*Subject.*
MED ED CONF. I . . .	WHO Pamphlet entitled "Some Training Aspects of India's Manpower Problem".
,, ,, ,, II . . .	WHO Pamphlet on Development of Paediatric Under-Graduate teaching in Medical Colleges, in India.
,, ,, ,, III . . .	WHO Pamphlet on Medical Education in South-East Asia.
,, ,, ,, IV . . .	Report of Sub-Committee No. I.
,, ,, ,, V . . .	Report of Sub-Committee No. II with appendices.
,, ,, ,, VI . . .	Report of Sub-Committee No. III.
,, ,, ,, VII . . .	A resume on the discussions by a Joint Committee on the reports of three Sub-Committees on the 19th and 20th of September, 1956.

Document No.	*Subject.*
MED ED CONF. VIII . . .	A note on Training in Humanities for the medical student by K. C. K. E. Raja.
" " " IX . . .	Memorandum of Association of Oto-laryngologists of India.
" " " X . . .	Certain suggestions for consideration by the Conference by K. C. K. E. Raja.

The following were invited to attend the Conference :—

1. Representatives of the Medical Council of India ;
2. Principals and Deans of Medical Colleges ;
3. Deans of the Medical Faculties of the Universities ;
4. Representatives of the Ministry of Health, India, and Directorates of Health Services, New Delhi ;
5. Representatives of the Indian Medical Association ;
6. Representatives of the International Organisations and of the neighbouring countries ;
7. Members of all the Sub-Committees ;
8. Special invitees to represent teachers of subjects not represented in the list above.

Dr. K. C. K. E. Raja and Dr. C. G. Pandit were entrusted with the task of preparing the report of the Conference for publication.

CHAPTER II

The inauguration of the Conference.

The inaugural session of the Conference was presided over by Rajkumari Amrit Kaur, Union Health Minister, and over 100 delegates attended the Conference representing Universities, medical colleges, the Medical Council of India and other bodies and individuals interested in medical education.

The Prime Minister of India, Shri Jawaharlal Nehru, and Dr. B. C. Roy, the President-Elect of the Conference, were also present.

A distinguished body of visitors from abroad also attended the Conference as observers. Among them was Dr. Alan Gregg, Vice-President of the Rockefeller Foundation, who had come out to India because of his abiding interest in medical education in this country, which he had the opportunity to study a few years back, during a stay covering several months.

Other distinguished visitors included representatives of South-East Asia Regional Office of WHO as well as members of the Health Ministries of different countries in the Region, and a delegation of five doctors from the People's Republic of China.

In declaring the Conference open Rajkumari Amrit Kaur made the following speech :

" May I first extend a warm welcome to all who are present here, this morning, our visitors from abroad and those who have come from different parts of India, to attend the Conference and participate in its deliberations. I am indeed happy to have in our midst a distinguished group of visitors from other countries, from the U.S.A., the U.K., the People's Republic of China and our own neighbouring countries of the South-East Asian Region. I am grateful to our Prime Minister for sparing the time, in the midst of most pressing and varied duties of great importance, to attend the inauguration of this Conference and to start its proceedings with words of advice based on his rich experience of men and affairs. I extend a special welcome to the Chairman of the Conference, Dr. B. C. Roy, who is also a very busy man with the care of one of our important States entrusted to him as its Chief Minister. He is, apart from being a statesman and politician, one of the most distinguished medical men of India with an intense love for his profession and for medical education and I am happy that he has responded readily to my request that he should preside over the deliberations of this Conference.

Among foreign visitors I am more than happy to have Dr. Alan Gregg with us. He has an abiding interest in India, and, in particular, in helping to shape medical education in our country on proper lines

During the latter part of 1951 and the beginning of 1952 he spent several months studying our problems in this sphere and left with us a report presenting a clear picture of the major defects in our set-up and suggesting certain essential reforms. I am glad that the Conference will have the benefit of his mature experience gathered over a long period from a large number of countries to which the Rockefeller Foundation has extended its beneficient activities over several decades.

URGENT PROBLEMS

The idea of calling together our prominent medical men to confer on the urgent problems associated with a raising and maintenance of the standard of our medical education has been in my mind for some time. My contacts with medical colleges and teachers and with the work of the Medical Council of India, the discussions I have had from time to time with Dr. Gregg and many distinguished visitors from other countries, who spent short periods of time in our universities and even took part in the teaching programme, brought home to me the urgent need for a comprehensive review of the whole scheme of preparation of the prospective candidate for the practice of modern medicine in this country, including the training to be imparted before he enters the portals of a medical college. The task that lies before the Conference is to cover this extensive field and to put forward proposals which will form a sound basis on which Government, the Medical Council of India, Universities and others entrusted with medical education may cooperate towards a progressive advance in the improvement of our standards of training.

I must add that, while the thought of having this Conference was maturing in my mind, the Rockefeller Foundation to which the country owes a deep debt of gratitude for the work it has been doing in the field of Health during many years in collaboration with the Central and State Governments, arranged a preliminary meeting at Bangalore in June last year, at which a small group of Deans and teachers from certain medical colleges and a few others interested in medical education discussed the desirability of such a Conference and the steps to be taken to bring it into being. When the proceedings of this meeting were brought to my notice, I gladly accepted the proposal for the convening of the Conference and my Ministry, in cooperation with the Rockefeller Foundation and an important group of our medical educationists, promoted a series of preliminary studies, the fruits of which are before the Conference as working papers to facilitate its deliberations.

EXTENSIVE FIELD

I have purposely suggested that this Conference should concentrate its energies on a study of under-graduate medical education. Even so the field to be covered is extensive and many difficult points arise for discussion as may be seen from the reports of the three Sub-Committees which have been submitted to the Conference. It is the training of the basic doctor which is the most important problem before

the country today. It is these doctors that will be concerned mainly with the administration of medical care to our people in its preventive and curative aspects. A further consideration is that it is only on a foundation of sound basic medical education that the superstructure of post-graduate training can be successfully built. Moreover, it is in the field of under-graduate training that various experimental studies are in progress in a number of countries. India must take note of these in her own interest and must also take into account her own special needs while shaping the future programme of under-graduate medical education.

During my tenure of office as Union Health Minister I have had valuable opportunities of studying at close quarters many of the problems of medical education and I would like to refer however briefly to some of my ideas.

The system of paying low rates of emoluments to teachers in medical colleges and of permitting them to supplement their income through private practice has had, in the past, a most harmful effect on the quality of the instruction imparted in our medical colleges. This system has also resulted in a neglect of research by the different departments of these colleges. In my opinion it will be to the lasting advantage of the country to pay adequate salaries to the Professors and thus not only free them from the anxiety and exacting demands of private practice but also enable them to promote sound teaching and research in their own subjects. Without this fundamental change no improvements, in my humble opinion, is possible and since medical science over-rides, by its very nature all barriers of caste, creed, race or language, I do trust that the need to harness the best personnel in our teaching institutions, no matter to which State they belong, will not be forgotten.

NEEDS OF RURAL AREAS

The purpose of medical education is to secure for the people the best service that modern medicine can make available. I believe that, in order to ensure that everybody obtains such medical care, it will be necessary, particularly with our large and widely distributed population, to provide State health services of adequate emoluments to the doctor and such facilities as are necessary for the efficient practice of scientific medicine. Such services will, I believe, provide employment for all the doctors which the country produces and will help towards their distribution in the rural areas. I have no doubt that a freer flow of doctors into the rural areas will be available if they are given the necessary facilities and amenities. Young doctors are no less patriotic than any one else but reasonably good accommodation, even a small practising hospital, free transport and some financial help to educate their children are necessary to make rural service possible for them. The Conference will, I trust, pay attention to the training of doctors who will be made competent to serve the needs of rural India with initiative and independence.

ENCOURAGING RESEARCH

Encouragement of research at different levels of under-graduate and post-graduate training is essential in the interests of both students and teachers. To the students, participation in research improves the quality of his thinking, makes him more observant and enables him to become detached and critical in his judgment. The teacher also shares these advantages with the student and, what is more, the quality of the teaching he imparts undergoes significant improvement. Participation in research also provides for more frequent contacts between the student and the teacher. These contacts are of benefit to both and more particularly to the student who will be guided slowly and perhaps unconsciously to sounder methods of thinking and to the acquisition of those indefinable qualities which association with a maturer mind promotes.

INTER-UNIVERSITY BOARD

Examinations, I feel, are today more a hindrance than a help towards sound medical training. Students are encouraged to develop their powers of memory much more than other important faculties such as initiative, correct thinking and ability to deal with new situations, as and when they arise. Examinations and the preparatory effort which the student puts forth take up so much of his time and interest that he is not able to devote proper attention to an understanding of what he is taught.

In the circumstances I do hope that the Conference will give serious thought to the need of so revising the present system of examinations as to make them effective for a progressive assessment of the student's progress and, at the same time, to ensure that there is no deleterious effect on his education. I believe that it is desirable to have some measure of uniformity in this country as a whole regarding the standards set at university examinations.

May I suggest for consideration that an Examination Board be set up at the inter-university level for this purpose ? I feel that such a body might prove to be of real help in this regard. I am glad to find that the Sub-Committees appointed to consider this question have agreed in principle that written examinations should be reduced or even eliminated and that prominence should be given to practical and oral tests. I am in entire agreement with this view. Tests of a student's memory are much less important than tests of his practical knowledge and technical efficiency and practical and oral tests may well be more effective in assessing these than written examinations.

METHODS OF SELECTION

I am also in agreement with those who have stressed the view that proper methods of selection and an early elimination of misfits among those who are admitted for medical education should be vigorously employed to prevent the huge waste of time, money and talent that

takes place at present is a result of the high rates of failures at all examinations during the medical course. Inadequacy of proper teaching as the result of large classes and an insufficient number of professors as well as some other factors may also be contributory to this unsatisfactory state of affairs. But I trust the Conference will pay attention to an exploration of the whole problem and will suggest suitable ways of finding a solution. I understand that in our country and abroad various studies have been carried out to determine the best methods of selection. Assessments of basic intelligence, of personality and of the level of performance of individuals, must take into account their cultural and social background if the tests are to be satisfactory. Therefore, tests designed and carried out elsewhere may not be the best ones for India. Experimental studies for the evolution of tests suitable for our own people are very desirable.

I find from the discussions on the reports of the Sub-Committees which met recently that there appears to be a sharp difference of opinion as to whether the qualification of B.Sc. should be made an entrance requirement or whether the recommendations of the Mudaliar Commission, which are under implementation, should form the basis on which pre-medical education is to be built up. The arguments for and against each proposal are clearly set out in the resume of the proceedings of these meetings. As it is a matter which is bound to receive serious attention from the Conference, I do not propose to offer any remarks at this stage. I have no doubt that the Conference will make its recommendation on a study of all relevant matters and on the basis of what it considers to be in consonance with the best interests of the country.

MEDIUM OF INSTRUCTION

I would urge for your consideration also the need to continue English as the medium of instruction at least for some time more. An abrupt change from a practice which has been prevalent in the country for over a hundred years will create numerous difficulties and will certainly result in a setback to medical education. I would, therefore, earnestly plead that the matter should receive serious consideration from the distinguished body of medical educationists who have assembled here. It will be unfortunate if, for sentimental or other reasons, a sudden break with the past is made and the interests of the present generation of students are not adequately protected. When Hindi becomes in verity our national language it will of course be wise to change over to it so that doctors, engineers, and other highly skilled technical personnel produced in different parts of the country may be utilised on a national scale. Translations, however, of standard works on medical literature should begin at once but we should accept international scientific terminology in medicine as indeed in all scientific spheres.

HUMAN RELATIONSHIP

Medical education, if it is divorced from the study of humanities, will tend to produce only a technician and not a physician endowed with the capacity to deal with human problem or with the sympathy and understanding necessary to win the confidence of the patients he treats. A study of the History of Medicine can be made the instrument to provide, for the medical student, a background of culture and understanding which will prove invaluable to him in the practice of his profession in the context of life. The relationship between doctor and patient is first and last a very intimate human relationship the quality of which is of the utmost importance to both. The more a medical man acquired for himself an understanding of human nature and of social relationships, the better does he equip himself for the wise use of his professional knowledge and experience for the benefit of his patients.

Finally, medical education is perhaps the most costly form of training and, if our intention is to attract the most best talent to the profession, a lightening of the financial burden is imperative. Exemption from fees, the free supply of books and a stipend towards the expenses of board and lodging may prove to be a substantial help to promote a freer flow of suitable talent to medical education than is perhaps taking place today. I would urge that the Conference should give serious thought to this subject also.

I have tried to refer to only some of the salient points that have struck me as deserving attention when the problem of medical education is discussed. I am sure that many more will be taken up by you for consideration.

Here is a great opportunity for our medical educationists, in association with our distinguished visitors, to review the various problems associated with the improvement of under-graduate medical education in our country. This opportunity, if properly utilised, may well mark the beginning of an era of determined effort by the country to ensure that the type of physician it requires will be produced not only in adequate numbers but also of the right quality. On the utilisation of the services of such doctors will depend largely the health and welfare of our people and an augmentation of their working capacity without which our programmes for national reconstruction cannot be fulfilled. I dare to hope that the labours of this Conference may have a profound influence on the future well-being of our country."

Shri Jawaharlal Nehru, the Prime Minister, then addressed the Conference as follows :—

" You have invited me I take it not because you think I can throw any light on the subjects which you are going to discuss but rather because the Prime Minister's presence here might draw more attention to the importance of this conference. I agree that the subject of medical education which you are going to discuss is of great national

importance, but I would like to view it in the larger sphere of education itself. In this field from time to time a number of committees and commissions consisting of eminent persons have been appointed and they have presented valuable reports, yet somehow we are still struggling with this problem and many of us are exhibiting a feeling of impatience and a sense of frustration that progress in this larger field is not as rapid as we would like it to be. This kind of hiatus between what we want to do and what our commissions decide and what is ultimately actually done is unfortunate. It may not entirely be the fault of government as in the implementation of those recommendations all kinds of other considerations including unfortunately the question of finance come in. Our ultimate object is, of course, to produce such conditions in India whereby everyone has abundant opportunities to grow. Your point of view, of course, is to see that the same opportunities exist for health whether it is public health or individual health I do not know how many have such opportunities. Some may have them and others may have no opportunities at all. This is a difficult problem. I realise it may be absurd to expect any sudden change and that our difficulties will be solved suddenly as if by magic. Nevertheless, we have got to do something about it. Again, we have to maintain adequate standards in education. I think it would be the greatest pity if we reduced our standards for the sake of speeding up, though I am terribly keen on speeding up also. How one has to combine these two things in the problem of health is really a matter which you will no doubt consider, but in doing so, I hope, you will pay some attention to the practical side of learning. We in India are apt to pay more attention and more time to book-learning than to the practical side. In our country there is far too much of a habit of memorising things in order to pass examinations. It is a very dangerous habit. Apart from a person not learning anything, he becomes stultified and possibly is not capable of growth later on. I think it is essential that the practical side is stressed much more in all our scientific pursuits and education.

I have just mentioned the question of finance. For spreading education, basic schools have to be established in every village and teachers have to be paid salaries necessary for ensuring efficient and contented service. I am told that the cost of having a sufficient number of such basic schools will take away the whole of our national income. Obviously, one cannot do it however important education might be. Some way has got to be found therefore whereby one can deal with this subject sufficiently justly and reduce the cost. Then there is another important matter with which you should concern yourselves. In this country there are a number of systems of medicine notably ayurveda and unani. There is no doubt that these systems contain things which are worth-while and it would be foolish to look down on them. Medical science should view everything in an objective manner and base its judgment on practical results.

Finally, I should like to pay tribute to my colleague in the health field, Rajkumari Amrit Kaur and her enthusiasm for the health pro-

blems. About your Chairman, Dr. B. C. Roy, I wish to say little lest I say too much because he is a very very old friend of mine to whom I go for advice in many matters inspite of his being a doctor, I cannot think of a better guide and counsel than Dr. Roy as the Chairman of your Conference. The deliberations of this conference, I am sure, will be helpful and beneficial to the cause of health in our country."

Dr. B. C. Roy then addressed the Conference :—

"Mr. Prime Minister, Rajkumariji and Friends :

I consider it a privilege to talk to such an august assembly as this about medical education. I started teaching medical subjects in 1906, *i.e.*, 50 years ago and I witnessed in the last few years particularly within the last two decades, that medical education and its objectives had long long changed with the changing world. I can give you a few examples of how things have changed during the last fifty years and in what direction. I remember that when first modern medical education was introduced into India, a gun was fired from the Fort William of Calcutta when in 1836, Pandit Madhusudan Gupta, with four of his pupils, rose superior to the then existing social prejudice and dissected human bodies in the outhouse of the medical college. They were the first Indians to do it. Since then the science of medicine is progressively changing. In planning medical education, in consonance with the modern developments in sciences all over the world, we cannot afford to ignore the background against which the present medical education in India has developed. We have also to realise that the target and purpose of medical education require emphasis in two directions : firstly bias on the part of the medical student for service in the rural areas where about 80 per cent. of our people live, and secondly, the modern objective is to find out not the disease in a person only but the disease in the person who happens to be a unit in a society of his own so that in order to treat the person, one must treat the conditions surrounding him in order that full results may follow his efforts. Medical education should be so modulated as to get this result. It is obvious, therefore, that the study of medicine in a particular country and perhaps in every part of this Sub-Continent will depend to a very great extent upon the purpose for which such studies are necessary. The development of medical studies in India had originally no plan behind it. We realise now that the bulk of our people who live in the villages should also have the privileges of being treated according to the scientific system and that the practice of this system should not be limited to big cities and urban areas only. This has a significant bearing upon the problems of medical education. When selecting students for admission to the medical colleges, we may give consideration to the standard of their achievements in the university examinations and also consider whether they possess some fundamental knowledge of basic sciences. But we should also insist on finding out if the entrant possesses some urge for giving service to the common man. For such purposes, it may be necessary to find out

the psychology of the individual as to whether his mind is tuned to rendering such service.

Then again it would also be necessary to find out to what extent the student imbibes the fundamental objective of the medical profession. What is the objective ? In the Medical College Hospital in Calcutta, there is a marble tablet on which is depicted the spirit of schools of medicine in the old days. The spirit of the schools of medicine in Britain seems to be " Do unto others as they should do unto you ". The spirit of medicine as laid down in the Ayurvedic system indicates that the " students must be those who would have their minds concentrated upon the work and behave with humility and with reflection ". They should during the course of their study try with their whole-heart to bring about the cure of all those that are ill, and they should never gossip about the practices in the patient's house. The Principal would ask the pupil, whether he would follow certain principles in his life and if the Pupil's answer was ' Yes ', he was admitted. In the Unani system also, a similar regulation was prescribed for the student. He had to take an oath that he would devote his time for the benefit of the sick, that he would not administer a deadly drug to anyone ; that he will live purely and holily and practise as he should. The duty of every medical student is to remember that " he must have a heart that never hardens, a temper that never tires and a touch that never hurts. "

As in the case of selection of students for admission, so also in the case of imparting instruction to them during the course of study, there have been various discussions on such topics as to whether the student does really profit by didactic lectures, whether he should come into more direct touch with the precepter than at present, whether the examinations held should be on the basis of the amount of cramming that the student has done or on the basis of the practical knowledge the student has acquired in the college and the hospital during the study period and what should be the nature and intensity of his studies in different subjects. Is it desirable in the first instance for the student to be a cramming machine, to commit to memory a large number of details regarding the human body and its functions which he may not ultimately be called upon to use ? Should we not restrict such course of study and give the student some knowledge which would be of practical value to him afterwards ? Should not the student have a bias for rural work and gain knowledge of the conditions of life in the rural areas ? What provision should be made in the course of medical studies for such purposes ?

As I have said before, the science of medicine is progressively changing. There was a time when people thought that the reactions of human tissues to disease factors depended on the reactions of some factors in the system. People are now realising that diseases are not produced merely by the introduction of bacteria into the system but that they can only produce the disease in the human being if the human being becomes receptive towards such microbes. The

Ayurvedic system depended upon a type of pathology which recognized the fact that in the human system there were some Rasas or humours, which affect the condition of the human tissues from time to time, from day to day and from morning to evening. Based upon such approach, certain methods of treatment were evolved which included dietary treatment which was suitable for restoring the balances of these three primary humours. As far back as 1917, I was struck while reading Sushruta that in the olden days too, they used milk for injection purposes for rheumatic infections. They used the bladder of an animal as a pump and the horn of an animal as a needle to inject milk into human tissues. We may not be able to appreciate the coarse nature of their appliances from the scientific point of view but we now realize that a human being is not a mere test-tube, that the body does not take in various substances both helpful and inimical to the growth and subsistence in the human system without effectively bringing about a change within the system. We are beginning to understand a little nowadays about these processes.

Thus we see that our future medical practitioners have to possess different bias so far as their practices are concerned. On the other hand, we are realizing more and more the fact that human being in all its parts down to the cells which compose them is vital, is living and reacts to various influences, physical, chemical, neurological, humoral, etc. We realize that human organism has to be adjusted to various factors like vitamins, internal secretions, etc. If the medical education is to progress it must take all such factors into account and it must incorporate in it the sciences which deal with these diverse subjects."

In proposing the vote of thanks, Lt. Colonel C. K. Lakshmanan, Director-General of Health Services, spoke as follows :—

"Mr. Prime Minister, Rajkumari Amrit Kaur, Dr. B. C. Roy, Your excellencies, distinguished guests, ladies and gentlemen :

I take this opportunity to thank you all for your gracious presence amogst us this morning. We are indeed very grateful to our Prime Minister for having found a little time in the midst of his numerous and pressing engagements to grace the occasion and give us some encouragement in the work that we are out to do today. To Dr. B. C. Roy, I would like to offer special greetings. We are all happy that he is here today, and for the next few days will preside over the deliberations of the conference. I am particularly happy Sir, that you are with us, as it reminds me of my days in Calcutta when I had the privilege to serve with you on many meetings and conferences on matters connected with medical education and medical relief. Rajkumariji, we offer you our special thanks. Thanking you is indeed thanking ourselves ; for, we all belong to one happy family in the Health Ministry. But a Minister is much more busy than some others, and knowing as we do how busy you are, we are extremely grateful to you for the encouragement and guidance you have given us ever since we promoted this conference. To the diplomats and our distinguished guests we offer our sincere thanks. To the delegates who

have come from all parts of India, we are very grateful and offer our felicitations ; as also to our friends from abroad who have taken a lot of trouble in coming to us and participating in our conference, travelling long distances and at much personal inconvenience. Your presence here is an indication of your goodwill towards us. I do hope that you will not only find this country hospitable and will enjoy your stay amongst us, but that you will also be able to take back with you something beneficial. I would like to mention in this connection the different international agencies, the Rockefeller Foundation and the World Health Organisation,—for the great interest they have taken in this conference. They have helped us in many ways. They have brought to this conference their experience, wide experience—in medical education, as you will all know from the documents which have been circulated to you.

Rajkumariji has already referred to various phases of the problem of medical education. So also our Chairman has made mention in his speech of the various aspects of the problem. This conference is not just like any other conferences we have had in the past. This conference has been called with a view to designing the whole structure of medical education to suit India and I venture to hope that you will be able to make really practical recommendations. I thank you all. "

Inauguration being over, the Conference re-assembled in the afternoon under the Chairmanship of Dr. B. C. Roy. The Chairman then invited Dr. Alan Gregg to address the Conference. Dr. Alan Gregg spoke as follows :—

" I remember that when I was an arts student at Harvard College—a Freshman aged 17—I had the courge to ask Professor Josiah Royce, the philossopher, what his idea of Heaven was. He replied promptly : " It would be my idea of Heaven to know the full significance of anything I was doing. "

Now in the light of the possibilities of this Conference, I remembered Professor Royce's remark. Certainly the results and developments of these coming hours and days of discussing medical education could approach the importance of an historic turning point in the history of medical education in India and South Eastern Asia.

Indeed I have an interest in the present moment because of another experience. I once heard a distinguished mathematician lecture on how a mathematician thinks. After observing that it would be hard for most people to think about the nature of time without mentioning any unit of time such as seconds, minutes or centuries, he said we could however think of time in terms of cause and results. Stepping to the blackboard he drew a large X. Consider the intersection of the lines as the *present,* and the widening lines above as the past and below as the future. Then the number of both causes and results increases as you move into the past (for causes) and into the future (for results). We are, at this moment, where the past ends and the future begins, so the results of this conference will multiply as Time flows on.

I recall the story of a young man who was leading life of heroic self-sacrifice in a self-imposed task of rural rehabilitation in one of our states at home. A friend said to him :

" This is fine spirit of you, John, to try to do all this but is it the right *time* to try it. " The reply was simply, " What other time do I have ? " No one of us at this conference can assume that he has years enough to devote to medical education to accomplish all he would like : it is time to start, now.

So, rather than attempt to present to you some phase of medical education, I have decided to offer a few comments on this conference and the subject of conferences as such.

Perhaps the most useful attitude to take in making a conference effective calls for a willingness to discuss matters in a fashion that is very tentative, preliminary, non-committal and theoretical. This attitude finds expression in the subjunctive or conditional mood. The subjunctive of the verb is reserved for unreality. It is the mood of curiosity, of exploration, not of final summation of positive facts. Indeed it is quite explicitly the mood to express unreality, and since the future by definition does not yet exist, the subjunctive serves the purposes of those who discuss plans for the future. I urge you to have this attitude in this coming conferences.

The results of conferences are mainly three in nature ; questions explicitly postponed, opinions embalmed in the verbiage of elaborate reports, or, on the other hand, in actions taken. I would agree that some questions that appear in a conference may wisely be postponed till later. This I believe is wise because I have noticed that it takes about a year for a man to change his mind decorously. If you force him to make a statement too soon he goes on public record as having a certain opinion—and then if he wishes to change that opinion it is too much of a loss of face to do so.

We all know that as a beautiful body requires but little clothing but a corpse requires much, so a conference that is a great success can be presented in but few pages whereas many pages are needed to cover the defects of a conference that has been a failure.

Ideally, the results of a good conference are few and clear. Indeed, the famous observation of Goethe in 1802 that " In der Beschrankung zeight sich erst der Keister " applied to the work of conferences, for freely translated this statement means " the master of a subject shows himself by knowing how to select the essentials ".

In short, conferences should be characterized by a free-ranging and tolerant curiosity, an immense amount of patience and a willingness to show a high degree of selectivity in the relatively few actions taken.

I shall not take more of your time. I am happy to be here and to see again so many of you whom I had the pleasure of seeing in their own colleges in 1951. "

CHAPTER III

Premedical Education and Entrance Requirements.

The Conference considered together the two subjects of pre-medical education and entrance requirements. There was unanimity of opinion regarding the inadequacy of the present system of preparation of the prospective medical student. It was also agreed that his training should include, in addition to scientific subjects, provision for a broad-based general education through such subjects as Humanities, Social Sciences, Psychology, and Mathematics.

The main difference of opinion was in regard to the question as to whether B.Sc. should be made a pre-requisite to admission for medical training or whether the revised form of education, which the implementation of the recommendations of Mudaliar Commission would provide, would suffice to equip the student adequately. Sub-Committee I strongly supported B.Sc. as the minimum entrance qualification, while Sub-Committee II was inclined to accept the shorter course based on Mudaliar Commission's recommendations.

Those who advocated B.Sc. stressed that the additional period of two years, which a revised B.Sc. course would provide, would be essential for fitting in all the new subjects. The greater maturity of the student, which this additional period would help to secure, would be a further advantage. It was pointed out that the nature and quality of the training which the entrant to medical education would have received would determine largely the extent to which he would benefit by the medical course as well as the length of period that might be required for the course. Sub-Committee I, while asking that B.Sc. be made an entrance requirement, had also pointed out that a considerable shortening of the training period in medicine could be secured by reducing the number of holidays, by shortening the period of university examinations through the adoption of new methods of examination and through the elimination of " revision holidays " as well as by holding university examinations during holidays.

Those who held the oposite view pointed out that the acceptance of B.Sc. would make medical education, which is already costly, even more expensive. The additional period of two years, which B.Sc. as an entrance requirement would entail, might produce, it was suggested, such a financial strain as to drive many bright boys into other professional channels. It was pointed out that the experience of certain medical colleges showed that B.Sc. entrants did not fare better, in the examinations during the medical course, than those who were admitted on the strength of their I.Sc. (Intermediate in Science) qualification. The need for taking note of what is desirable under the conditions

prevailing in India was stressed. In certain countries the tendency is for an increasing percentage of admissions to medical colleges to be those who have completed their degree course. On the other hand, in other countries such as the United Kingdom and U.S.S.R., entrants to medical education were picked up after they had completed the Senior Cambridge course and corresponding types of higher secondary education. Would the conditions in India, including the need to produce a reasonably large number of doctors and the economic position of the people, justify a prolongation of the period of training by two years, which insistence on B.Sc. would necessitate ?

Those who opposed the proposal for B.Sc. also stressed that, by making the selection of the future aspirants for medical education well ahead of the time of entry and by providing appropriate courses of training for preparing them for medicine, a better type of medical student could be secured than under the present system.

Minimum age of the student entering a Medical College.

If B.Sc. degree is considered essential for admission to medical colleges, then the minimum age at which a candidate enters medical college would be 20 years. This is computed on the basis that the minimum age for completing higher secondary school is 17 years and the revised B.Sc. course is of three years' duration.

If, on the other hand, the proposed reorganisation of secondary education is made the basis of selection, the candidate for admission to a medical college will be 18, whether the school from which he completes his secondary education is a higher secondary school or a S.S.L.C. or Matriculation school. In the case of the last two it will be remembered that he has to take up a year's course of pre-university training and another of pre-medical education.

Taking all these matters into consideration the Conference passed the following Resolution :—

Premedical Studies and Entrance Requirements

" The Conference considers that the training programme recommended by the Mudaliar Commission on Secondary Education, including the proposal for a pre-professional course of one year, will meet the requirements of pre-medical education and that, pending the introduction of the changes suggested by that Commission, the passing of the Intermediate Examination of Indian Universities with science subjects should continue to be the minimum qualification required for admission to a medical college.

" The suggestion was put forward that the selection of a student for medical training might be carried out after S.S.L.C. or Matriculation examination and that an attempt should be made to modify the training of the selected student during the Intermediate course so as to equip him better for medical education. In addition to Physics, Chemistry, and Biology, it is desirable to include, as far as possible, elementary mathematics, elementary genetics, logic, psychology, and English. "

Abstract of Discussion

Dr. V. S. Mangalik

Sub-Committee I was of the opinion that the present system of pre-medical education was inadequate. Students who came to Medical Colleges after passing the high school examination followed by intermediate examination in science with physics, chemistry, and biology as special subjects are not sufficiently well equipped in the basic concepts of social sciences, humanities, psychology, and mathematics. They show lack of mental maturity and are not inclined to inquisitiveness and independent thinking. In order to remedy these defects the Sub-Committee suggested that pre-medical education should consist of a specially designed B.Sc. course of three years' duration so that a broad-based education in natural sciences and humanities might be given to those who propose to enter medical colleges.

In making this suggestion the Sub-Committee gave serious consideration to the recommendations of the Mudaliar Commission on secondary education. These consist of (a) abolition of intermediate examination ; (b) raising the present high school or matriculation standard of training to a higher secondary course by lengthening the period of study by an additional year, the student thus being enabled to complete higher secondary course by the time he attains the age of 17 ; (c) after completing this course, a three year term of study for a university degree in arts or sciences, and (d) in the case of professional education such as medicine or engineering a year of pre-professional training after passing the higher secondary examination before the students become eligible for a professional course. Until all the existing high schools are converted into higher secondary schools, the Mudaliar Commission recommended, as an interim measure, that a pre-university training course of one year should be given to the students before admission to the university degree course after passing the high school examination. In the case of candidates wishing to take professional studies, the Commission recommended another year of pre-professional training. Thus, in effect, the recommendations of the Mudaliar Commission provide for two years of training after the high school examination which corresponds to the two years of the present Intermediate course in the universities.

The Sub-Committee was of the opinion that one year of pre-university training and one year of pre-professional training as recommended by the Mudaliar Commission would not bring about the required changes in the mental maturity and cultural background of the entrants to the medical course. The Sub-Committee, therefore, recommended a three-year degree course to be given in the universities, which would prepare the students for entrance not only to medical colleges but also to other post-graduate studies in arts and science colleges. The Sub-Committee felt that with the co-operation of the university teachers and medical educationists it should be possible to devise the curriculum of the three-year degree course

specially suitable for a career in medicine. The Sub-Committee was fully alive to the implications in implementing this suggestion but felt that if the objects of medical education are to be served, this re-orientation of pre-medical education was essential.

Dr. P. Kutumbiah

Every one here agrees that the present pre-medical educational system needs to be reformed. The Mudaliar Commission have recommended the abolition of the intermediate examination and suggested the addition of one year's study to the present high school curriculum with the object of improving school education and to round it off satisfactorily. Although the Union Government has accepted this recommendation and is trying to implement it, not all the State Government have found it acceptable.

The crucial question is : will the student trained for medicine, according to the recommendations of the Mudaliar Commission, attain the proficiency required for the making of a good doctor? It is submitted that neither the existing system nor the system recommended by the Mudaliar Commission is sufficient in its scope to improve the basic general education of the candidate to the requisite level. It is absolutely necessary to put medical education on a proper basis in order to turn out not only the curative type of doctors but also those who will be able in future to initiate and contribute to research. I wholeheartedly support the recommendation of Sub-Committee I that B.Sc. should be the minimum qualification for admission to the medical college.

Dr. B. B. Yodh

Although Sub-Committee II was assigned the task of considering the curriculum, methods of teaching and so on, it had also discussed entrance requirements because of the inter-relationship of the various items. Sub-Committee II was of the opinion that it was not wise to change over from the present requirement of Intermediate in science to B.Sc. straightaway. The changes that are likely to occur in the near future in secondary education will result in a type of student who is better fitted than at present for medical studies. Prospective medical students should receive one year of pre-medical training on a broad basis in the science colleges which is flexible enough as not to obstruct their pursuing another profession should they desire to do so at the end of the training period.

Until the reorientation of secondary education takes place, I think we should go on with the present Intermediate in science course with the addition of some subjects in order to make the preparation for medical studies more broad-based.

Dr. S. J. Mehta

We should not rush in hurriedly with any fixed programme of pre-medical education in the present circumstances. The present

schools are not fit enough to take up higher secondary education. The University of Bombay have not yet been able to decide the subjects which should be included in the secondary school education and in the Intermediate in sciences. Things are still in a fluid state. The present defect with medical education is a composite one comprising of deficient training in the school, defective teaching, dearth of equipment, etc. On account of these factors, the research atmosphere does not exist in the medical colleges. The defect therefore is not with the students only.

Dr. M. L. Gujral

The medical student on entering a medical college is woefully ignorant of the humanities, social sciences, and even science itself. This is the result of poor training at the primary and secondary school levels. It is at this stage that we want to take proper care of the aspirant wanting to enter a medical college. Premedical education should start at the ninth year of school and should be continued through the tenth and eleventh (higher secondary) years. Selection to the medical college should be made at the end of the eleventh year of school and during the next year, *i.e.*, the twelfth year, premedical subjects such as medical physics, medical chemistry, medical mathematics (medical statistics), general knowledge, a foreign language (French or German) should be taught. On the basis of this system a four-year medical course, soundly planned, should be all that is necessary to make a general practitioner and a sound quantitative scientist.

A B.Sc. Degree, in my opinion, is unnecessary for admission into a medical college.

Dr. K. L. Wig

Will the proposed change to B.Sc. as a minimum qualification improve the quality of students admitted to medical colleges? I do not think so. It would in fact lead to a deterioration.

Under the present system, a student can become a medical graduate at the minimum age of 22 to 23 years. Under the new system of higher secondary education, together with one year of premedical studies, the student will start his medical career at the age of 18 and will qualify as a graduate at the age of 23 or 24. If you make B.Sc. as the minimum qualification he will qualify as a doctor at the minimum age of 25 to 26 years. How many parents can afford such an expensive education for their children? Considering the economic status of the country, the result of making B.Sc. as the minimum qualification will be that most of the intelligent students will be sent to shorter and more lucrative courses and we will get an inferior quality of students for medical studies.

Further, it has been our experience that B.Sc. students prove actually inferior to the Intermediate in science (I.Sc.) students during

their medical course. This is due to the fact that only those B.Sc. students, who could not gain admission to medical colleges at the I.Sc. level, come for medical studies.

Dr. A. C. Ukil

Training in general science must be improved and it must be given in properly equipped secondary schools by specially trained science teachers. The science subjects should be taught from the sixth or seventh class onwards.

I feel that Mudaliar Commission's recommendations may be accepted. Pending their implementation the present status of secondary education and I.Sc. course of training should be modified in accordance with the recommendations made by Sub-Committees I and II by paying special attention to mathematics, physics, chemistry biology, humanities and social sciences. In order to get future research workers and teachers in medicine, I suggest that 25 per cent. of the admissions be reserved to high class B.Sc. graduates and if necessary such candidates may be offered merit scholarships.

Dr. V. R. Khanolkar

The position as regards the age at which the future student will graduate under the two proposals may be summarised as under :—

Sub-Committee I.	*Sub-Committee II.*
Student enters Medical College at 20 years (17 *plus* 3 years for B.Sc.) .	Student enters Medical College at 18 years (one year pre-university *plus* one year pre-professional).
Completes the medical course (4 years) at 24 years.	Completes the medical course (4 years) at 22 years.
Completes internship (1 year) at 25 years.	Completes internship (one year) at 23 years.

Let us concentrate our attention on how to improve the content and quality of education. According to the famous saying " We should add life to years and not years to life. " We should not add years to the course but knowledge to it.

In most of our things we have followed the United Kingdom. The medical student there is selected after the Senior Cambridge Examination. In Germany the requirement is Gymnasium and in France Buccalaureat. I have therefore considered that we should direct out efforts not at increasing the age at admission to the medical course but rather on improving the training between the ages of 15 and 18 years, including the one year of pre-university training and one year of pre-professional training.

Dr. D. Govinda Reddy

I believe that the present system of two years' course after school examination is sufficient for admission to medical colleges. At present, B.Sc. degree holders are also eligible for admission but this should not be made the minimum qualification as it will prove to be a hardship financially. Lengthening of medical course is also not desirable in view of the short life span in the tropics. Further, it is doubtful whether a student because he is a B.Sc. is better suited for research. It is his aptitude and the inspiration he gets during his medical study that count. So I submit to the house that an emphasis should be on improving the syllabus and training in the post-school two years of study in the university.

Dr. A. A. Ayer

While the previous speakers come into contact with the medical student in the third, fourth and fifth years as Professors of clinical subjects, I as Professor of Anatomy come into contact with him at his admission to the medical college as do the Professors of Physiology and Biochemistry. The Student that come to us is not lacking in intelligence but due to his immaturity of age he does not take to his studies with the metivation necessary for a professional course. The comparison that has been made of the present B.Sc. admitted to the medical college with the I.Scs. is not a fair one as it happens that many of the present B.Scs. are those who have failed to get admission to the medical college at the I.Sc. stage but if the best I.Sc. student gets the grounding of the B.Sc. course he will certainly be a better candidate than at his earlier I.Sc. stage.

What is the difference between the B.Sc. course and the higher secondary course, one may ask? In the B.Sc. course quantitative analysis is taught and training in precise methodology is given. Such a training is essential for the candidate to be admitted to a medical college. We are not here to make compromises or to suggest what could be the second best. We are planning for what is best for the future of medical education in India. Whatever else might be planned, the whole superstructure stands on the student admitted to our colleges. He is the foundation of the whole structure. Let us lay the foundations strong. I beseech you to accept the B.Sc. standard as the minimum necessary for admission to the medical colleges.

Dr. S. C. Sen

After years of struggle we succeeded to a large extent in having licentiate medical schools either abolished or upgraded. Except in two places there is only one type of medical course, namely, the graduate course throughout the country. If you insist on making B.Sc. the minimum qualification for entrance into medical colleges, there is a danger that State Governments might start different courses of instruction in medicine in their States. We cannot overlook the

financial implications of insisting on B.Sc. qualification. I, therefore, submit that there should be no insistence on the minimum standard of B.Sc. Let the B.Scs. and M.Scs. or even Ph.Ds. come and join the medical colleges. They are welcome but do not insist on such standards.

Dr. J. S. Carman

We are specialists in various branches of medicine but amateurs in educations. If we have had special degrees in education we ought to be approaching this subject in a scientific way. We need controlled experiments, several of them in different places and in different ways. Let us try something partly with B.Scs. and partly with I.Scs. There are many good reasons for a great diversity of opinion. A conference is necessary with secondary school and graduate educationists to find out as to how they can give our pre-medical students what we want them to have. This will answer some of our questions.

Lt.-Col. Amir Chand

The recommendation of Sub-Committee I that B.Sc. should be the minimum pre-medical qualification is, I am afraid, undesirable for the following reasons. Firstly, the economic condition of the country is such that few parents can afford to give such a lengthy and costly education to their children, nor can State Governments give substantial stipends to a majority of the students to bear the cost of education. Secondly, the return that a medical graduate gets from State service or private practice is not commensurate with the time, money and energy spent on his education. Thirdly, if the recommendation of the Sub-Committee is accepted the best brains will be attracted to other professions which require shorter and less expensive training with better dividends in the end. Further, considering the low average span of life in India, the utility of medical graduate will be considerably curtailed if the course of training is made too lengthy by adding three more years to pre-medical education.

I feel that the Sub-Committee's recommendation, if implemented, will tend to retard the production of medical graduates in adequate numbers so badly needed for medical relief in the country. It is true that even now many B.Scs. apply for admission to medical colleges but they are those who obtain low second or third divisions in their I.Sc. examinations and who failed to secure admission after I.Sc. They are on the whole poor students with their brains mostly burnt out. It is not true that a second class B.Sc. is necessarily a better educated and more intelligent person than a first class I.Sc.

For these reasons, I would urge that the programme of training proposed to be given on the basis of the suggestions embodied in the report of the Mudaliar Commission be accepted.

Dr. C. S. Patel

The number of students admitted to the Grant Medical College every year is 120. The average age of the students at admission is roughly between 18 and 20 years. A very small percentage gets admitted at 17. The suggestion to make B.Sc. the minimum entrance qualification will raise the age of admission to 20 to 23 years and the medical studies will be completed by 27 to 28 years. This is not a practical suggestion. I favour strongly the admission of the students after the I.Sc.

Dr. B. P. Trivedi

There are two types of training : training basic doctors for medical relief in rural areas and training doctors for the advancement of medical science. To my mind it is not possible to have one uniform system of medical education for these two types. Regarding pre-medical requirements, the student must be taught humanities and social sciences. The change from I.Sc. to B.Sc. will not relieve this problem. For the present we should stick to I.Sc.

Dr. P. C. Rakshit

The pre-medical students' knowledge of basic sciences is at present poor. I support the suggestion that higher secondary education and one year's pre-university course should be made the minimum requirement. Until this reform comes into effect, certain changes in the existing I.Sc. course and secondary education course should be made in order to emphasize the teaching of science subjects with special reference to their application in medicine.

Dr. B. C. Roy (Chairman)

If I may summarise, there seems to be unanimity of opinion in the House, except for two or three dissentions, that the present I.Sc. should continue to be the minimum qualification for entering the medical course, until such time as the recommendations of the Mudaliar Commission's report are implemented. Certain suggestions have been thrown out at the meeting that the selection of the candidates for medical studies may be made even during the second year I.Sc. course rather than at the end of it.

CHAPTER IV

Selection of Students

This subject attracted considerable attention from the Conference. The resolution, that was adopted at the end of the discussion, took note of the major factors in relation to selection, as will be seen from a perusal of the recommendations of Sub-Committees I and II on the subject and of the abstracts of the remarks made by individual speakers, which are given in the appendix to this chapter. The recommendations of Sub-Committees I and II are briefly stated below :

Sub-Committee I made three suggestions :—

(1) Admission should be based on merit determined by competitive tests.

(2) There should be a written examination in (a) Chemistry, (b) Physics, (c) Biology, (d) General ability, and (e) English comprehension. The written examination may be of the 'essay type' or 'objective type' or both.

(3) Every student should undergo, before admission to a medical college, an examination for physical fitness, which should include radiological and other examinations.

Sub-Committee II considered that selection should be based on two main principles, namely, (a) the academic performance of the student from the 8th standard onwards, and (b) his extra-curricular activities.

It was only a section of Sub-Committee II that favoured a comprehensive entrance test. Some of the members also felt that interviews, if properly organised, might prove useful. It was suggested that a small number (not exceeding 10 per cent. of the admissions) of border-line cases might be selected after interview.

An important suggestion of Sub-Committee II, after taking note of the fact that certain methods of selection have been in operation in some medical colleges, was that free scope should be given for experimentation in the methods of selection and that all the methods should be reviewed at the end of the first five years.

The discussion that took place at the Conference brought out a variety of views on the procedure adopted for selection in different parts of the country. Doubts were expressed on the desirability and value of interviews, the difficulty of giving proper weightage to extra-curricular activities was stressed, and existing differences in procedure

were pointed out such as some State Governments requiring admissions to be allocated on the basis of individual districts and/or of different communities, and certain private colleges giving special consideration to the candidates nominated by the authorities which help them financially. Some Governments have felt it necessary to distribute the total number of seats available in the medical colleges under their control on the basis of certain principles they have laid down in accordance with what they consider to be the demands of the people in their respective States. It was pointed out that such methods of selection militated against merit as the most important criterion to be taken account for admitting students to medical colleges.

The abstracts of the remarks made by individual speakers (see the appendix to this Chapter) show, as already pointed out, a wide range of variation in views. Taking these into consideration the Conference passed the following resolutions :—

" Taking note of the difficulties arising from the different methods of selection of candidates for admission adopted by various medical colleges in the country, the Conference considers that the development of common criteria for selection may have to await the reorganisation and improvement of secondary education on the lines recommended by the Mudaliar Commission. In the meantime the Conference recommends :—

(1) that for the next few years, each college should continue its own method of selection taking into account the desirability of including in the criteria for selection (a) the academic record of the student and (b) his extra-curricular activities ;

(2) that, in assessing the academic record, the student's performance at the Matriculation or S.S.L.C. examination and the Intermediate Science examination should be taken into account as well as his class records for two or three years immediately preceding his admission to the medical college ;

(3) that, after a preliminary scrutiny and elimination of those who do not fulfil the minimum requirements applicable to all candidates, the others should be interviewed by a committee, the main purpose being to ascertain the nature of the extra-curricular activities of the candidates and to access the value to be attached to them in the case of each student ;

(4) that, taking note of the fact that, under existing conditions, the allotment of a certain proportion of seats for candidates from some special classes of the community is inevitable in certain parts of the country, the minimum standards prescribed for these classes may be fixed at a lower level than for candidates in general and that, if none of the candidates in these special classes comes up to the level of the prescribed lower standards, the seats may be turned over to the general pool ;

(5) that, records regarding selection should be kept so as to bring out, in the case of each candidate, (a) his academic records, (b) his

extra-curricular activities, and (c) the results of personality or aptitude tests and of any other special tests that may be employed ; and

(6) that the data so collected should be reviewed periodically in order to evolve suitable criteria for adoption by the country as a whole. "

SELECTION OF STUDENTS

Abstract of the discussion

Dr. Vengsarkar

The problem of selection of students has been engaging the attention of the government and institutions in recent years. There are two aspects of this problem—(1) qualifications for entry and (2) selection from amongst those who are so qualified. Regarding the first aspect, there are two viewpoints, *viz.* whether a person should be admitted after graduation in a science course which is modified to include social science, humanities, mathematics, etc., or whether he should be admitted after the higher secondary school and one year of premedical education. It has been decided this morning that the latter course is preferable. I would further state that in order to achieve the aims and objectives of medical education which are to produce a basic doctor with an orientation towards the social and preventive aspects of medicine, we should select students in their formative period of life between the ages of 17 and 18 at which they are not only mature but also suitable for being moulded and developed during the medical course to meet the needs of this country.

The other aspect of selection is the criteria for selection and how to assess and measure them. The criteria for discussion may be grouped as follows :—

1. Race, religion caste, colour, nationality, sex and financial status
2. State preference and donor's preference
3. Health
4. Suitability and aptitude for medical career
5. Character
6. Enthusiasm
7. Capacity
8. Intelligence

As regards qualities in group 1, I think all would agree that we should not discriminate between candidates on these considerations. As regards qualities in group 2 in connection with State preference, it is a problem which does not come within our purview, as it is a matter of State policy. Reservation of seats for donors' nominations deserves immediate discontinuation on account of evident gross abuses of this

privilege by the donors. With regard to group 3, *viz.*, the health of the candidates, there is unanimity, and we all agree that the candidate to be admitted should be physically fit. As regards qualities from 4 to 8 groups, these are abstract and difficult to assess or measure. To know the personal qualities of candidates requires long and close personal contact with them. In this connection I would quote Dr. Carmichael, President of Tufts College in 1947, who, during discussions at the Institute of Medical Education where six conferences were held on the subject, quoted Lord Kelvin as follows :

> " I often say that when you can measure what you are speaking about and express it in numbers, you know something about it ; but when you cannot measure it, where you cannot express it in numbers, your knowledge is of meagre and unsatisfactory kind. It may be the beginning of knowledge, but you have scarcely in your thought advanced to the stage of science whatever the matter may be. "

It is also necessary to bear in mind that these qualities are the result of a biological process and are therefore governed by biological laws like mutations of the genes, and are likely to alter for various reasons unknown to us at any time, and we have come across cases where a good student or citizen turns to be a bad student or citizen later on, and *vice versâ*. The selection, therefore, should mainly be based on the following considerations :

1. Academic achievements as seen from scholastic records of the last two years of the Higher Secondary School certificate ;

2. Interviews should be held for the border-line group of students on the above considerations and to assess extra-curricular activities which foster personal qualities for example, social work, humanitarian activities, work in community projects, etc. Credit given to interview including extra-curricular activities should not be more than 10 per cent.

3. An entrance examination which includes general ability test may be held if the college desires to do so.

The problem of selection arises because of larger number of applications than the available number of seats. It can be solved by starting additional medical colleges and by altering the objectives and patterns of medical education which should rather serve the social and preventive aspects of health in India than mere clinical practice that brings financial returns. Many students are attracted to a medical career not for serving the health needs of their country but by promise of a higher economic status or profit motives. This will be checked by a change of objectives of medical education to suit the real needs of the population in this country.

Further selection can be made after admission by assessment of the progress of the student at the end of the first pre-clinical year.

This naturally involves assertion of our needs and changes in the curriculum to fulfil those needs. As suitability of the candidates would depend upon the objectives of medical education and accordingly to the course of studies, methods of training, emphasis on the subjects most suited to medical needs in the country, it would be natural therefore that detailed discussions on the subject of selection should better follow a discussion on the subject of curriculum hours, teaching methods, etc. and be geared to it.

Dr. Carman

We have a curious situation in our medical colleges. We have heard this morning as many time before that India's great need is for doctors and more doctors, but in many cases the colleges are not sufficiently well equipped to give adequate training to the number of students who are admitted, nor do some of those who are given admission possess those qualifications which would make them good doctors. Further high rates of failure at the examinations promote a waste of financial and human material. All these point to the urgent necessity of improving the methods of selection for admission to medical colleges. The one criterion to be kept in mind is that a person, after training, should become a " good doctor ". This is a very difficult criterion to define and to utilise, but, if the difficulty exists, there is no justification to bypass it. A good doctor is particularly required for work in rural areas. For years the needs of the villages have been met by sending out second-rate and third-rate men. A doctor working in a village has to be professionally sound and more flexible and intelligent than one working in a city.

The next point is the method of selection. Sometimes we take students on recommendations. I think the experience of everyone here is " the better the recommendation the poorer the student ". If you take only I.Sc. marks, you can form some opinion about the candidates. If special tests are introduced into selection, the content of their method, their validity and relevance must be considered. All this shows the need for experimentation. Fortunately we at Vellore have made a study of this problem for eight years and have developed our own methods of selection.

Dr. Basudeva Narayana

During my tenure of office as Principal, Patna Medical College for over 8 years I had the occasion to try different methods for selecting candidates for admission. These were (1) University examination results plus interview by a Selection Committee of over a dozen members, (2) University results alone, (3) Competitive Test Examination. Interview only helped in selecting candidates who were on the border-line. Aptitude tests were never tried but to my mind they will serve no useful purpose in the selection of the bulk of students.

Perhaps they may help in selecting candidates in the tail end of the list. Marks secured at the I.Sc. Examination may form a good basis for selection but when students come from a number of universities, the relative evaluation of the I.Sc. results becomes difficult. So far as B.Sc. passed candidates are concerned, I had made it almost a rule to select those who had passed B.Sc. with Honours and with respect to those who were only B.Sc. pass, a substantial weightage was always given. This system, however, was not considered good enough to provide the best candidates and was open to criticism for several reasons. A system of competitive examination was therefore introduced in which there was a written examination in subjects of Physics, Chemistry and Biology. This has definitely improved the quality of students admitted and has also relieved us of a good deal of worries. Perhaps it would be a good idea to introduce a paper in general knowledge at the competitive test examination. I would therefore recommend that admissions be made on the results of a special test and this examination be thrown open to all candidates who have passed I.Sc. with Physics, Chemistry and Biology as also to qualified B.Sc. candidates.

Dr. Kurulkar

I intend to supplement certain points to the introduction of the subject of " Selection of Students " by Dr. S. G. Vengsarkar.

Out of the three suggestions regarding the selection the first suggestion namely " Consideration of academic record " needs no comment. Regarding the other two suggestions, namely entrance examination and interviews, it was considered that full freedom should be given to different institutions to implement these suggestions by any methods they choose, as a matter of experiment. All the findings of these experiments should be reviewed after five years by the conference of teachers. On the basis of this experimentation some definite guidance could be given in the method of selection to the medical institutions.

This was what the joint meeting of the three Sub-Committees decided.

Dr. Nigam

We have tried at the Medical College at Nagpur selection by means of competitive tests and interviews. There are three points that one has to consider in evolving the various methods of assessment—firstly the practicability of a particular method, secondly the uniformity of that method and thirdly its exactness. From our experience we did not find the selection of students by process of competitive examination at all satisfactory and the question of outside influence could not be ruled out. We now select candidates on the number of marks obtained by them at the I.Sc. examination. We give a weightage of 50-60 per cent. for the total marks obtained by the candidate, 10 per

cent. for the interview and the remaining for his extra-curricular activities. The Selection Committee in the case of many colleges is composed of the Director of Health Services, Principal of the medical college and some other member not connected with the institution. This is not satisfactory. Selection of the candidates should be done by the teachers of the college itself. The conference should also discuss the number of students to be admitted to the college.

Dr. Nambiar

In my opinion interview always brings in the personal factor. On the other hand, the results of the intermediate examination eliminate this factor. This should be the only method of selection. The appointment of a Selection Committee also brings in outside influences. In a State like Madras there is the problem of distribution of seats on the basis of communities and district wise. In my opinion while backward classes require special consideration, such consideration should not be extended to other sections of the community.

Dr. Dikshit

I have no direct suggestions to offer regarding the various methods for the selection of candidates. I want this conference, however, to remember that in certain universities about 3,000 applicants have to be dealt with and, therefore, if the conference were to recommend any particular method of selection, it should also recommend the machinery necessary to handle this large number of applicants.

Lt.-Colonel Sangham Lal

The recommendations made by the Sub-Committees were laid down by educationists, who aimed at ideal methods. A majority of the medical colleges are maintained by State Governments and these governments have laid down the rules for the admission of medical students. These rules are often designed to meet the wishes of the people in particular areas. Madras Government, for instance, have reserved certain percentage of admissions to students from the backward communities and have also reserved a certain number of seats for individual districts. No government would be able to ignore the wishes of the people. I would like to know what machinery is proposed to implement the ideal methods that had been put forward.

It is not clear to me what is meant by border-line cases. Would it be candidates with marks in the neighbourhood of 40 or 45 or 50 per cent.? It would be easy enough to choose students with high marks, but that should not be the sole criteria. I do not believe that the 10 per cent. marks proposed to be allotted to extra-curricular activities would suffice to give adequate weightage to students with lower marks. The total number of marks in the intermediate examination is about 400 and if 40 more marks are added for extra-curricular activities the result would not materially affect the chances

of many such candidates coming in. From my teaching experience I can say that those who get the best marks were not necessarily the best students to be taken up for admission to the medical colleges and they might not grow up into the best doctors for the service of the country.

Dr. B. N. Banerjee

Why do we select candidates for admission ? Is it to assess the aptitude and ability of the student and to cut down the number of failures and revision courses ? My answer is no. This may be the scientific approach for admitting students for medical studies but at the present moment until we have re-organised the system of education and examinations on proper lines any rigid and scientific system of selection for admission will not be of much value. Do we select students for the purpose of admitting a limited number out of the large number seeking admission for the limited accommodation available in the college ? My answer is yes. The method I recommend is that we should take into account the I.Sc. marks combined with Matriculation or S.S.L.C. marks and the record of academic career of the candidate during the past two years from the head of the institution. We should take into consideration also the record of extra-curricular activities of the candidate during the last two years.

Dr. Sarkar

I receive about 1,000 applications for admission to the Calcutta Medical College. A preliminary weeding is done so as to eliminate I.Sc. candidates with second division and candidates with less than 40 per cent. marks in certain subjects like biology and chemistry. Regarding extra-curricular activities, the certificates produced by the candidates are not given any special value. The members of the Selection Committee supply, as far as possible, such information as they possess regarding the extra-curricular activities of individual students. I feel that by this method no grave injustice will be done to the candidates.

Dr. B. B. Yodh

Regarding interview, it is necessary to clarify that Sub-Committee II felt that, in order to assess the value of aptitude tests and the value of interviews generally, colleges should arrange for interviews in case of certain students where academic assessment and extra-curricular activities assessment are not sufficient to take a decision for admission. This was the meaning of border-line cases for interview.

Dr. Alan Gregg

I would like to mention one point which has not been mentioned. It all depends how you answer the question for yourself. Do you believe that we differ among ourselves in our capacity to judge human

beings, to judge other peoples' abilities ; some men have this capacity to judge the ability better than others. Such people have to be put on admission committees because that is where they belong.

It would be helpful if you could require of each teacher not only his opinion of the student's performance in his course but also of his impressions of the student's general ability and character. By comparing the accuracy and skill of these general impressions as shown by the students' later record, we could find which teachers have the best ability as judges of students' abilities and character. Such teachers' services should be put on the admission committee.

There is again one other point which has not been mentioned. There is no other degree which opens the fields of careers to as wide an extent as the medical degree. We are not all training our students as general practitioners or specialists. We want them to be hospital administrators also. We want them to devote themselves to other wide fields. We should have all this in our minds and not take too narrow a view of his initial qualifications. I am not sure, for instance, that physics or chemistry is the best qualification for one who is going to be a hospital administrator. That is perhaps a little absurd to say but it conveys my point of view.

Lt.-Colonel Amir Chand

No fool-proof method of selecting students has been evolved or is likely to be evolved. There can be, at least at this stage, no common yard-stick which can be applied to all medical colleges. It is highly desirable to allow a certain amount of flexibility to the colleges in the conduct of the various experiments that they may be trying or may like to try in respect of the methods of selection of the students. The results of such experiments should be reviewed after a certain number of years. Scholastic ability should be the chief but not the only criterion for selection. It should be determined by the performances of the candidates in the various School Board and University Examinations. It is superfluous to hold a special entrance test. Next to scholastic ability, if not equal to it, is good physique and sound health.

Some weight should be attached to extra-curricular activities. In order to assess the other traits which are essential to make a successful doctor, such as character, personality, acuity of observation, thoroughness and aptitude, etc., the candidates should be interviewed individually or in groups.

If the system of nomination is to be retained for various reasons it should be laid down that no candidate who has not secured at least 50 per cent. marks in the Board/University examinations should be selected.

Dr. Roy Chaudhury

Regarding selection of candidates for admission in the medical college different methods have been in vogue in different places in

India. In some cases admissions have been made on the result of the I.Sc. examination while in some other interview is resorted to. In still others, there is a separate competitive examination for the purpose consisting of a written and oral test.

The claims in favour of each of these methods are so very contradictory that it would be difficult, if not impossible, to lay down any of these methods as completely fool-proof. Each of these methods has, however, some justification of its own. From our experience it appears that selection of candidates may be made by a combined method where (1) the result of the intermediate examination, (2) a competitive test, and (3) a *viva voce* in the form of testing the average make-up of the student would be the most desirable procedure. At the present moment such a method of selection is already in existence for admission in Engineering Colleges and in some Medical Colleges too. A very important factor about the selection of candidates is to pick up the right type of students by noting their attitude towards the social economy of the country and their aptitude towards social services.

Dr. Jivraj N. Mehta

So far as academic record of a candidate is concerned, I feel that it might not be possible to get it from the school in which the candidate had studied but that his performance in the School Leaving Certificate or Matriculation Examination might be of help in ascertaining the nature of his record. If extra-curricular activities were to be judged by interviewing all the candidates then the position would be extremely difficult. Under the circumstances I hold that interviews might be held only in border-line cases.

Dr. B. C. Roy (Chairman)

I would briefly sum up the views put forward during discussion. Three points had emerged from the remarks made by the different speakers.

One was the emphasis laid on the academic career of the student before he sought admission to a medical college and the need to have information pertaining to this for a period of two or three years. Whatever might be the position in other States, in my own State it was hardly possible to have any such connected records about a student.

The second point was about the value to be attached to extra-curricular activities. Both the Prime Minister and myself had emphasised yesterday the need for the future medical practitioner to be a social physician in medicine. Therefore an aptitude shown by a candidate for activities such as those of a boy-scout or other forms of social welfare work should be taken into account in selection.

The third point, on which there was considerable divergence of opinion was the question of interview. If properly used an interview had its value, although it was defective in certain cases. It would be

desirable to have a system whereby the interviews would be done not by one person but by three persons together, each giving his own remarks separately and then the results being pooled towards an assessment of the candidate.

Other questions were also raised such as certain rules for admission imposed by some State Governments and other authorities managing medical colleges. As regards backward classes, protection had been guaranteed in the Constitution. State Governments might feel it necessary to lay down rules to satisfy the demands of different areas within the States. If selections were to be done under such circumstances, it should at least be insisted upon that the candidate was not below a certain prescribed standard. If a sufficient number of such candidates were not forthcoming from backward and reserved classes the unfilled seats should be thrown open to the general body of candidates.

In view of the different methods so far adopted by different institutions it would be wise to give only general directions to medical colleges at this stage and then to review the position after a period of five years. If these suggestions were acceptable to the Conference, a draft resolution incorporating them would be placed before the meeting for consideration.

CHAPTER V

Curriculum Hours

Sub-Committee II had made detailed recommendation with regard to the total curriculum hours to be included in the period of 4½ years of study and specific hours to be allotted to each subject. The specific recommendations of Sub-Committee II will be found in Appendix I of that Committee's report. In making its recommendations, the Sub-Committee was guided by the following considerations :—

1. The teaching programme must emphasise that the student's attention is directed towards the patient as a whole and not merely to the disease for which he seeks relief ;
2. The development of a preventive point of view in medical practice ; and
3. The creation in the medical student of an interest in and an understanding of special problems of health and disease in villages, by enabling him, during his training period, to have experience of rural conditions and to participate in rural health work.

There was considerable discussion in the Conference on the total number of hours available for the entire curriculum and the number of hours to be allotted to each subject. The Sub-Committee had envisaged a total number of 5,100 hours distributed as—1,500 hours for preclinical subjects and 3,600 hours for clinical subjects. These were on the basis of 180 working days during a year and 5½ hours for each working day. It was suggested during the Conference, however, that the total number of hours during the clinical period could be increased by increasing the number of working days in the year and the number of working hours in the day, say to 8. The additional hours thus secured could be utilised by each college to emphasize in its own way the teaching of certain subjects and to bring about an integration in teaching.

As was to be expected there was no unanimity of opinion among the participants on the number of hours to be allotted for each subject. With regard to anatomy, for example, there was difference of opinion as to the amount of dissection that a student has to perform in the anatomy class. While some speakers were of the opinion that a general dissection of the entire body was essential, others felt that only certain parts need to be dissected by the student and the anatomy of other parts dealt with by suitable demonstrations.

In the teaching of histology, Sub-Committee II had recommended that general histology should be taught along with anatomy while

organ histology should be taught with physiology. Here also there was a divergence of opinion among the participants. The opinion of the majority was, however, that histology should be taught with anatomy.

The question of the teaching of organic chemistry was raised and the Conference was unanimous in its view that this subject should be taught at the premedical stage.

With regard to pharmacology, Sub-Committee II had allotted 200 hours. In the opinion of some pharmacologists this provision was inadequate. They thought that it should be raised to 300-350 hours.

For pathology, Sub-Committee II had allotted 570 hours in the curriculum. Some participants in the discussion felt that this amount of time was excessive and that it could easily be reduced to 400 hours. The Sub-Committee also recommended that 800 hours should be given to the teaching of surgery, in which it had included the subject of ophthalmology also. In the opinion of some speakers there was need to increase this provision to 900 hours, particularly if ophthalmology was to be added to surgery. On the other hand, in view of the importance of ophthalmology to the country, it was urged by certain speakers that special treatment should be accorded to the subject that it should not be submerged in surgery and that it should be retained as a separate subject in the curriculum, with a separate examination held on it.

Similar views were expressed with regard to medicine and paediatrics. There were references, during the discussion, to the teaching of preventive and social medicine and while the importance of the subject was recognised by some, one member was of the opinion that this subject was given too much importance and that it was not necessary to allot any specific hours to it. On the other hand he suggested that the subject of family planning should be included in the curriculum in view of its growing importance to India.

Throughout the discussion several speakers referred to the need for the teaching of clinical and pre-clinical subjects in an integrated and co-ordinated manner.

Although the Conference discussed, in some detail, the curriculum hours for each of the subjects it recognised that it might not be proper to take any definite decisions in the matter. The recommendations made by Sub-Committee II provided a valuable guide to medical colleges for formulating their own programmes of teaching, taking into account the tentative nature of these recommendations and the need for suitable adjustments by individual colleges to meet local conditions and their special requirements. The Conference expressed the unanimous opinion that the recommendations should be circulated to universities, medical colleges and the Medical Council of India for

serious consideration. The Conference then adopted the following resolution :—

> " The Conference recommends that the suggestions regarding curriculum hours on different subjects of the medical course, which are set out in Appendix I of the report of Sub-Committee II, should be circulated to the universities and medical colleges as the basis for a reorganisation of their undergraduate teaching programmes and that, after a period of two years, the results of such reorganisation be reviewed in consultation with all relevant authorities. "

CURRICULUM HOURS

Abstract of discussion

Dr. A. A. Ayer

The subjects to be taught in the pre-clinical course are anatomy including topographical and regional anatomy, embryology, genetics, histology, neuro-anatomy and surface and radiological anatomy, and physiology including biophysics, biochemistry and experimental physiology, amphibian, mammalian and human. The teaching should be integrated by the teachers of subjects of anatomy, physiology and biochemistry sitting together and planning classes. The real integration takes place in the mind of the student and the teachers can only help partly by bringing together the different aspects of a topic more or less at the same time. The advantage of being taught by a specialist has to be retained and so teaching will be necessarily compartmental but integrated to the extent possible.

The liaison between clinical and non-clinical subjects could be achieved by clinical excursions of the preclinical students to the hospital or by the " incursions " of patients to the demonstration classes in anatomy and physiology.

Regarding the time taken for teaching, if the total time available for anatomy and physiology is about 1200-1500 working hours the morphological subjects of the anatomy group will take half of the time and the functional subjects physiology and biochemistry will take the other half. In each subject the practical classes would take two-thirds and the lecturers, lecture-demonstrations and seminars would take one-third of the time.

Regarding how much to teach, there has been a lot of talk about what are minutiae. Whatever information is not essential for the general understanding of the basic principles of the subject are minutiae ; whatever has no bearing on the clinical medical sciences are minutiae ; whatever a teacher cannot remember to teach in his class but must refer to his notes for his lectures are minutiae.

Whatever else we may be able to cut out from our curriculum, let us have an opportunity offered to the students to dissect the human

body fully at least in a general way, though not in great detail, and let the student also have some of the experiments in amphibian physiology for their fundamental value to demonstrate the scientific method. Unless we retain a full course of dissection of the human body, the foundation for training of a competent doctor will not be laid.

Dr. B. C. Roy (Chairman)

I would like to raise two points (1) in some States there is a scarcity of human bodies for dissection, (2) there is a point of view that detailed dissections are not as important as proper demonstration of various parts of the body to the students in a much more deliberate manner than it is done today.

Dr. Ayer

The Anatomy Act is being enacted in some of the States and if others follow suit then there may be no dearth of bodies. As I have already stated unless the whole human body is dissected the training of the student will be deficient.

Dr. Jivraj Mehta

I recollect that some years ago when the Aligarh Muslim University wanted a medical college to be established in Aligarh, I had impressed upon the authorities the necessity of having adequate number of bodies available for dissection and asked them if the University would agree to the dead bodies of Muslims being made available for this purpose. The Syndicate of the University had passed a resolution agreeing to do this.

Dr. B. Narayana

The number of working hours in anatomy could be effectively reduced by reorientation in the plan of dissection. It would be a good idea if the entire class dissects the same part ; then it will be convenient for the class to proceed with the dissection more speedily and thus save working hours for anatomy. This plan is being followed in other Universities in the U. K. and U.S.A.

Dr. S. C. Sinha

In teaching anatomy it is possible to reduce the quantity of dissection by allotting some parts only to the students to get them acquainted with the nature of the tissues and supplement their study of the remaining parts by suitable demonstrations. What is essential for understanding medicine and surgery should be taught and the details which are always forgotten eventually need not be stressed. Anatomy taught in this way will remove the usual fright and aversion and make the lessons more attractive and effective.

Dr. Kurulkar

In deciding about the curricula, it would have been better if we had considered before this item, the adoption of two types of studies, Formal and Elective. As we are going to train a person who would later on become any one of the following, *i.e.*, rural practitioner, teacher, research worker, specialist or administrator, all these diverse aims can be fulfilled only by adopting a system of formal studies and elective studies.

For a basic training, in my opinion the dissection of the whole body is not needed. The dissection which each student should compulsorily do should be of three parts :

1. One of the extremities
2. Abdomen
3. Either of the following :—

   Head and brain, Thorax, Neck.

Other Pre-Clinical Subjects.

Dr. Subodh Mitra

In the pre-clinical course anatomy, physiology, pharmacology and pathology have been included. In some States organic chemistry is also taught in the pre-clinical course. It would be impossible to cover all the four basic and fundamental subjects in the 1½ years of pre-clinical course. Definite directive must be given as to whether organic chemistry should be included in the pre-clinical course or taught in the pre-medical course. In the Calcutta University we are going to recommend that pharmacology and pathology should come under the clinical course.

Dr. B. C. Roy (Chairman)

Anatomy, physiology, pharmacology and pathology have to be taught together. If you are teaching anatomy of a particular organ you should also discuss its functions and the influence of drugs on it and its pathology. When these four subjects were put in the pre-clinical course, it was perhaps intended that a general foundation should be laid in these subjects.

Dr. B. K. Anand

I wish to clarify some of the recommendations of the Sub-Committee with regard to pre-clinical teaching as some confusion exists in the minds of previous speakers.

(i) Teaching of the whole of pharmacology and pathology is not included in the pre-clinical 1½ years. Only a few hours have been allotted to these subjects in the pre-clinical years to teach those aspects which can best be

taught along with anatomy and physiology. These subjects will be dealt with mainly in the clinical years.

(ii) It was recommended that the best way to teach histology would be to link it with both anatomy and physiology-general histology to be taught with anatomy and histology of special organs with physiology.

(iii) Organic chemistry is not to be taught either with pharmacology or biochemistry but in the pre-medical year where more emphasis is to be laid on medical aspects of physics and biochemistry including organic chemistry.

Dr. B. B. Dikshit

It is not possible, to decide the details of teaching in a conference like this. We must first decide what is the aim of our medical education. If we want to produce a general practitioner details can be omitted and a simple practical course can be evolved. Details of physiology, anatomy, etc., could again be taken up in teaching specialists and research scholars. If, however, we want to teach students who are going to be either general practitioners or specialists or research scholars it is not possible to teach anatomy, physiology, etc., in the curtailed course of 1½ years.

Dr. B. Narayana

The teaching of organic chemistry should be done at the I.Sc. stage in Universities. Certain amount of organic chemistry has to be taught in any case along with biochemistry in the medical college in order to make the teaching of biochemistry more receptive. It is immaterial whether histology is with physiology or anatomy, so long as there are suitable teaches of the subject and there is integration in teaching anatomy, histology, physiology and biochemistry. The attempt should be made to integrate teaching of the pre-clinical subjects as in Birmingham.

The number of working weeks in the pre-clinical period is about 50. The number of working days per week is 5½ and there are roughly six working hours per day. The total number of working hours would thus be 1,650. This period is divided for teaching anatomy, histology, physiology and biochemistry plus introduction to pathology and pharmacology. To fit the teaching of all these subjects in 1,650 hours requires reduction of the course.

Dr. P. C. Nambiar

In the Punjab University organic chemistry is taught in the I.Sc. class and the same procedure may be adopted in the other Universities also. Pharmacology may be taught in the third year and the examination in this subject held at the end of this year.

Dr. M. L. Chakravarti

The teaching of physiology should include histology, physiological chemistry and experimental physiology and should be done by a medical man in order to give a medical bias to the student, whether he becomes a general practitioner, research worker or administrator. This will save time and energy and will be beneficial to the candidates because it prevents reduplication in the study of histology and biochemistry.

Dr. M. L. Gujral

The teaching of pharmacology during the first 18 months during 50 hours is highly unsatisfactory. We teach theoretical and experimental pharmacology concurrently and this is hardly possible during this period. Introductory pharmacology courses in the first 18 months have proved valueless and are obsolete. It is my firm conviction that in 200 hours it is not possible to teach a growing and important subject like pharmacology. A minimum of 300 to 350 hours are required for teaching this subject and these may be divided as under :—

(a) Didactic Lectures . .	100 hrs.
(b) Experimental Pharmacology 30 sessions of 2½ hrs. each . .	75 hrs.
(c) Practical Pharmacology 20 sessions of 2 hrs. each . .	40 hrs.
(d) Demonstrations	50 hrs.
(e) Tutorials	50 hrs.
(f) Toxicology	35 hrs.
TOTAL	350 hrs.

Dr. B. C. Bose

In the report of Sub-Committee II, the maximum number of hours in pharmacology in some medical colleges in India was found to be 320 and the average is 215. The Committee has recommended only 200 hours to the subject which is considered by the pharmacologists to be very inadequate. The subject today comprises of : (a) general pharmacology ; (b) chemical pharmacology ; (c) systemic pharmacology ; (d) experimental pharmacology ; (e) pharmacy ; and (f) applied pharmacology. The satisfactory minimum number of hours to be allowed to the subject should be as follows which then will be on par with other progressive countries of the world :—

(1) General and chemical pharmacology lectures . . .	25 hrs.
(2) Systemic pharmacology lectures .	75 hrs.

(3) Applied pharmacology lectures .	20 hrs.
(4) Experimental pharmacology classes	60 hrs.
(5) Pharmacy practical classes . .	50 hrs.
(6) Quizzes and seminars . .	20 hrs.
(7) Tutorial class and demonstrations	50 hrs.
GRAND TOTAL	300 hrs.

Dr. C. S. Patel

The question of integration that is being talked about will not be possible unless the colleges are fully staffed. In 16 colleges there are no assistant professor or lecturers. It is well nigh impossible to teach anatomy, physiology, histology, pathology and pharmacology in 18 months' time with the present staff. Emphasis is being given in all parts of the world today on preventive medicine and here again the need for good teachers is most important. If there are no proper teachers then all the discussions will be reduced to a farce.

Dr. B. B. Yodh

In old days the students had a fair amount of time to study for themselves. Now they are being increasingly tied down to too much class work and for too many hours. The opinion of teachers from many of the colleges was obtained and it was clear that the teaching time was in need of reduction and the curriculum hours recommended by Sub-Committee II were on that basis. This Conference might agree that teaching the pre-clinical subject by a co-ordinated effort of the teachers would help to cover the course in the curriculum hours suggested.

Clinical Training

Dr. B. C. Roy (Chairman)

Let us now pass on to the consideration of curriculum hours to be allotted to clinical subjects.

Dr. B. B. Yodh

The curriculum hours have been suggested after careful consideration of the information received from colleges and universities regarding the curriculum hours already in force. It was felt that they could be reduced and reorientated and the tables submitted by Sub-Committee II were prepared on that basis. They are not sacrosanct but can be altered to suit different subjects and different teachers. But this will only be possible if a close coordination obtains between the teachers of the different subjects.

Dr. V. S. Mangalik

In my opinion 570 hours of teaching of pathology is much more than is required in the medical curriculum. This period will be difficult to fit in the time-table and places for too much stress on the teaching of pathology. I feel that about 400 hours will meet the needs of the student in the programme of medical education.

Dr. P. N. Wahi

The teaching of Pathology as envisaged by Sub-Committee II includes Pathology, Bacteriology, Parasitology and Legal Medicine. The proposal of 570 hours out of a 5130 hours of the total curriculum are not excessive. We have to remember that the concept of Pathology has undergone complete change during last 25 years. The medical students should be provided with opportunities to perform experiments in Pathology as part of their curriculum in order to emphasis the dynamic concepts of disease and provide some contact with experimental methods. The enhanced teaching is also advisable with the increasing and desirable emphasis on Preventive and Social Medicine as this Conference has emphasised. The student has to be introduced to maintenance of health, preventive measures, public health aspects including training and participation in immunisation programme. To achieve this an enhanced training in Pathology, Bacteriology and Immunology is essential.

With the reorientation of educational programme, it is but natural that teaching of pathology should be reorientated. The teaching is to include social pathology, psycho-pathology, etc. Further, pathology is bound to play an important part in the integrated teaching programme, *e.g.,* integration with preventive medicine, social medicine, general medicine and surgery, etc. This would mean holding of seminars, clinico-pathological and surgico-pathological conferences, tumor clinics, etc. The time for this has to be provided, and should be provided. With a good training in Pathology, the person can act as a co-ordinater in the integrated programme like a conductor in an orchestra.

This concept of enhanced training in Pathology is not only my personal way of thinking. I find that three important medical institutions in the United States have also allotted similar number of hours though their total hours are less than the one proposed by the Sub-Committee II, *i.e.,* less than 5,000 hours. At Harvard Medical School, Pathology hours are 669, at Western Reserve University 544 and at Cornell Medical School 649.

Taking the above points into consideration, I feel that 570 hours as recommended by Sub-Committee II are not too much and I recommend to this Conference that these be accepted.

Dr. R. Nigam

(i) Reorientation of hours, as depicted by Sub-Committee II, regarding surgery, requires to be changed as follows :—

	Recommendation of Sub-Committee.	Proposed change from recommendation of Sub-Committee.
First Year . . .	300 hours	(+) 150
Second Year . . .	200 hours	(−) 125
Third Year . . .	300 hours	(−) 25

This reallocation of hours is necessary because of the university examinations in pathology, pharmacology, etc., at the end of fourth year when the student is busy preparing for these examination. No doubt the examination system requires reorientation, but it will continue as it is for some more time.

(ii) I suggest that the number of hours for surgery should be made 900 like those for medicine.

(iii) With the inclusion of ophthalmology in surgery, more than 800 hours will be required. Ophthalmology is an important subject in this country.

(iv) Sub-Committee II suggested three months of training in pediatrics. I suggest that one month of this period be allotted to surgical pediatrics. The need for this will be appreciated when the number of surgical disorders in children is realised.

Dr. S. T. Achar

Sub-Committee II recommended that the importance of pediatrics should be reflected in the curriculum and that three months should be devoted to this subject. But in Appendix I under suggested curriculum, 900 hours are set apart for medicine which includes pediatrics, tuberculosis, leprosy, skin and venereal disorders, part of radiology, etc. I think the importance of pediatrics would be better reflected if the subject is shown under a separate heading and 200 hours specifically put down for this purpose.

Lt.-Colonel Amir Chand

Talking of specialities, it is submitted that pediatrics should not be made subservient to medicine nor ophthalmology to surgery from the point of view of both training and examinations. They should be treated as major independent specialities. Both of them are of very great importance in this country and to make them subservient to medicine in one case and surgery in the other would be to belittle their importance. It would not be enough to set one question on pediatrics in the paper on medicine and one on ophthalmology in the paper on surgery. That would be most inadequate. If written examinations are to be retained, there should be a separate paper on each of these two important specialities, as well as separate practical

and clinical examinations for which purpose pediatricians and opthalmologists should be associated with physicians and surgeons as examiners.

Dr. S. C. Sen

With regard to the curriculum, it appears to me that the committee have been obsessed with the idea that every doctor will become a rural practitioner and perhaps also a research worker. Too much emphasis appears to have been laid on so called "Social medicine", a subject which is vague in its conception and has yet to be adequately defined. Whilst I am fully convinced that every medical man should have a balanced training, and be alive to the preventive and social aspects of medicine, this could be achieved by proper integration and orientation of teaching by the teachers of medicine, surgery, midwifery, etc., and not necessarily by enlarging the department of Social Medicine and alloting to it hundreds of hours for lectures and demonstrations.

Considerable discussions have taken place, and numerous reports have been published on this subject. I need not repeat them. I would, however, like to point out a doctor may ultimately end up either as a

(a) Professor or research worker
(b) Administrator
(c) Public Health expert
(d) Businessman — controlling pharmaceutical or other industry
(e) Practising doctor — practising a speciality or as a so called general practitioner or family practitioner.

Taking things as they are, a large proportion of the doctors will be the so called general practitioners or family practitioners. The nature of the work they will have to do, will depend on the locality where they will work, whether in the North or in the South ; whether in cities or small towns or rural areas.

Even though it is essential for a doctor to have knowledge and training, say in midwifery and gynacology, we know that hardly any medical man in North India gets a chance to practise, either ; it is the special monopoly of women doctors. Whilst a city doctor has specialists and consultants to fall back upon in case of difficulties, doctors in small town and rural areas have no such facilities. They have to deal with every type of case, and as such, they must have wide general knowledge, must know the rudiments of opthalmology, E. N. T., Dermatology, even though these are recognised as specialities.

Because of the reasons given above, may I suggest that adequate provision be made to include training (and particularly methods of diagnosis and examination and treatment of simple diseases) in these subjects in the curriculum.

In the U. K., it has been proposed that post-graduate 3 years training be provided to those who will take up general practice. May I suggest that special training and courses of study be prescribed for those who will settle down in rural areas. As things are, rural doctors will have to be appointed by the State on salary basis, and they could be given adequate training on appointment (depending on the needs of the situation) without unduly loading the undergraduate curriculum and this could be supplemented from time to time, by refresher courses as is being done in the U.S.S.R.

May I also plead for inclusion in the curriculum, the subject of medical ethics—the importance of which cannot be overstressed.

In addition to subjects discussed in the curriculum I would like to press for inclusion of a course of instruction in family planning, because of its importance to medical care and health of the nation.

Dr. Vishwanathan

I agree in general with the recommendations made by Sub-Committee II about curriculum hours. I would, however, suggest that because ophthalmology is an important subject and as it is included in surgery the hours provided for surgery should be increased.

Dr. Carl Taylor

Rather than feeling slighted on subjects with deficient hours as illustrated on page 26 of the Sub-Committee's Report we should turn to pages 27 and 31 and see what is going on in India today. Surgery now has 815 hours ; we have given 800 hours. Obstetrics and gynaecology has 426 hours ; we have given 400 hours. These differences are minor and subject to local adjustment.

Dr. Subodh Mitra

I feel that on a broad principle preventive obstetrics should be given a high priority as this forms the fundamental basis of the science and practice of obstetrics.

Dr. Yodh

The accepted recommendations of this Conference should be circulated to the Universities, Medical Colleges and the Medical Council of India for their consideration and implementations wherever possible. After two years a review should be made of what has been achieved with regard to these recommendations and further steps then considered.

CHAPTER VI

Subjects requiring special emphasis in the curriculum.

The primary objective of medical education is to train men and women to fulfil increasingly the need for medcial care that exists in the community and to contribute to the progress of medical sciences. One of the main tasks of the Conference was to formulate suitable steps for a reorientation of the undergraduate curriculum in the attainment of that objective. In the previous Chapter, the lines along which the Conference visualised a reorientation of the existing curriculum have been presented together with a tentative framework of the curriculum. The present chapter deals with the subjects which the Conference singled out as requiring special emphasis in the reoriented curriculum. These were :—

Preventive and Social Medicine ;

Paediatrics ;

Psychological Medicine ;

Post-mortem Studies ;

Libraries and Museums ;

History of Medicine ; and

Medical Ethics.

Each of these subjects is considered here separately.

Preventive and Social Medicine

Sub-Committee II, which was charged with the task of a preliminary consideration of this subject, has recommended that it should be taught throughout the undergraduate course with the object of focussing the attention of the student, from the very beginning, on the concept of positive health and on the continued maintenance of health and prevention of illness, or in other words, on an understanding of man in relation to his environment. The Sub-Committee had also recommended that the subject matter should be taught in an integrated manner in collaboration with the other departments of the college and had suggested that high priority should be given to the training of persons to equip them to perform the function the department of preventive and social medicine is intended to fulfil. The Sub-Committee had suggested, in the curriculum, a provision of 390 hours for this subject, which was to be distributed as 160 hours in the pre-clinical period and 230 hours in the clinical period.

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COMMUNITY HEALTH CELL
LIBRARY
AND
DOCUMENTATION

There was a lively discussion in which several delegates participated and unanimous support was given to the view that there should be a full-time Department of Preventive and Social Medicine in every college manned by persons who would be able to bring about a complete change in the existing approach to the teaching of medicine, which rests mainly on the inculcation, in the student, of curative principles and practices. The subject should be so taught to the students, through lectures, lecture-demonstrations and practical work in the field, that its philosophy, with its emphasis on the preventive aspect of medical care, may become an integral part of their way of thinking and may thus help to promote in them an automatic and continuous preventive outlook in dealing with the health problems of the individual and of the community.

The student, when he enters a medical college, is generally motivated by a spirit of idealism and of social service. These altruistic impulses continue to survive and thrive under conditions which facilitate contact with his fellow men, their physical and social environment and their daily life of joys and sorrows. On the other hand the early part of the medical curriculum excludes opportunities for such contacts and concentrates on an intensive course of theoretical and practical instruction in pre-clinical subjects ; this training is, no doubt, essential for properly equipping the medical student, but it lacks the vitalising influence of human interests. At a later stage of his course the marvellous achievements of medical and surgical practice tend to grip his imagination and to turn his attention and ambition towards the attainment of clinical acumen and high technical skill. Such attainment is necessary from the point of view of his future performance as a medical man. Even so, his practice of the science and art of medicine becomes truly effective in contributing to the welfare of the community only if it is guided by a social outlook and illumined by the spirit of service. How far can the Department of Social and Preventive medicine help to preserve in the student the ideals and ideas of service with which he enters the medical course and to develop them, during his career at the college, into an abiding force which makes him recognise, throughout his professional career, the social functions which Medicine should perform ? The Conference considered that this was the task to be accomplished and that, in attempting to do so, the teaching of preventive medicine should start from the first year of the course and that opportunities should be provided to enable the student to see for himself the meaning and purpose of medical care in the context of the actual life of the community. The teaching of preventive and social medicine, interpreted in the sense indicated here, should permeate the entire course of training at the medical college and should extend even into the period of internship.

The purposes set forth in the previous paragraph could be achieved, it was felt, only if the teaching given by the Preventive and

Social Medicine Department were integrated with the training programmes of other departments, particularly the clinical departments, and if the co-operation of the teachers of these departments was secured by enabling them to have a clear understanding of the objectives which Medicine, as part of the social service to which the community is entitled, should seek to attain. The need was also stressed to have the course in preventive medicine so devised as to meet the specific problems of India, particularly in the fields of environmental hygiene, communicable diseases, maternal and child health and nutrition. The Conference expressed warm appreciation of the curriculum of integrated teaching put forward by Dr. Carl Taylor, which fulfilled the purpose of meeting the needs of existing Indian conditions ; this curriculum has been given as appendix V to the report of the Sub-Committee II.

The discussion stressed the importance of practical work in a Rural Health Centre as an essential part of the training and it was suggested that every medical college should have a Rural Health Centre attached to it to serve as a practice field for the student. Such centres would provide considerable opportunities for undertaking research into rural health problems. They would form excellent training grounds for students in the principles of rural medical practice which has to be largely unaided by laboratory tests under existing conditions.

The need for training all students in the fundamental principles of statistics was stressed and it was suggested that those with a background of mathematics and with interest in statistics might be encouraged to take up a detailed study of the subject during their elective hours. (See Chapter X for discussion on the concept of Electives).

It was suggested that there should be a separate examination in Preventive and Social Medicine at the final M.B.B.S. examination. There was a sharp difference of opinion amongst delegates on this question, the other view being that periodical assessments of the work of the student in this subject throughout the course should prove sufficient.

In the light of this discussion, the Conference passed the following resolution :—

CONSOLIDATED RECOMMENDATIONS ON PREVENTIVE AND SOCIAL MEDICINE RURAL EXPERIENCE AND BIOSTATISTICS

1. There should be a Department of Preventive and Social Medicine in each medical college with full-time staff.

2. The teaching of the department should start with the first year of the medical course and run through all the succeeding years, including internship. The distribution of hours and courses of instruction are indicated in appendices 1 and V of the report of Sub-Committee II.

3. The teaching of the department should be integrated with the teaching of all the departments of the medical college. For instance, a co-ordinated outpatient service should be developed in which students, accompanied by medical social workers, follow the patient to his home and are helped to study the social environmental and other factors relating to his illness, the concerned department such as Medicine, Surgery, Paediatrics, Psychiatry, Obstetrics and Gynaecology also participating in this joint study. Such a study should be followed by a seminar in which all the concerned departments participate.

4. Rural and urban health centres should be associated with the Department of Preventive and Social Medicine. They form the laboratories in which practical experience can be acquired by the student and studies in community health problems can be promoted, the student being encouraged to participate in such studies. The Department of Preventive and Social Medicine will be in charge of these health organisations.

5. The Rural Health Centre will provide the necessary facilities for giving rural experience to the students.

6. A separate examination in Preventive and Social Medicine should be part of the final M.B.B.S.

STATISTICS

1. The pre-medical training given to the prospective medical students should include elementary mathematics so as to provide a basis for his subsequent training in Statistics during the medical course.

2. A compulsory course of elementary statistical training should be provided for all students in the pre-clinical period, the experimental data from field surveys and laboratory work, especially in physiology and pharmacology, being utilised for practical training.

3. An elective course during the clinical years should be available for those who are interested, a fuller study of epidemiology also being associated with it.

PAEDIATRICS

Sub-Committee II, which considered the subject of paediatrics, recommended that three months of the curriculum should be devoted to this subject, one of which may be included in internship period. The Sub-Committee also suggested that the subject should be taught in the three following stages :—

1. The growth and development of the new-born ;
2. Diseases of the new-born ; and
3. Diseases of children.

The distribution of the teaching programme was to be somewhat as follows : One month in the third year to be devoted to teaching

the methods of examining children in health and disease and to lectures on growth and development ; one month in the final year was to be devoted to ward and out-patient work of the Paediatrics Department together with systematic lectures on diseases of the new-born and of children. The last one month was to be spent in internship in paediatric wards. Details of the manner of teaching the subject are presented in Appendix VIII of the Sub-Committee's report.

During the discussion of the subject at the Conference a number of interesting points were brought out by the participants. For instance, it was pointed out that the child population of the country formed about 2/5th of the total population and that nearly 40 per cent. of the total work of a basic doctor related to paediatric work. It was, therefore, emphasised that the teaching of paediatrics should be thoroughly re-organised and that greater attention should be paid to it than in the past. Every college should have a separate department of paediatrics and there must be a separate examination in the theory and practice of paediatrics conducted by paediatricians. In planning the curriculum in paediatrics care should be taken to see that there was no duplication of teaching in the various departments of the college ; for, it should be recognised that paediatrics is neither an organ speciality nor a disease speciality. It is general medicine applied to an age group with problems which are peculiar to a growing organism.

There was some discussion as to whether new-born babies should come under the care of obstetricians or paediatricians. The general feeling was that the therapeutic care of new-born babies might be left to obstetricians, while teaching of the diseases of the new-born might be undertaken by paediatricians in collaboration with obstetricians. A point was also raised as to who should be entrusted with the care of children with infectious diseases, the paediatricians or infectious diseases specialists or physicians. It was suggested that sufficient emphasis was not laid in the existing curriculum on the teaching of infectious diseases and that the care of such children should be entrusted to paediatricians. One of the delegates suggested that it might be worth while to explore the possibility of developing paediatricians into a separate cadre for service to the people as has been done in some other countries.

The Conference then passed the following resolutions :—

In view of the vital importance of paediatrics in the overall programme of undergraduate medical education and in view of recent developments in the subject, the Conference recommends :—

1. that a separate Department of Paediatrics should be established in each medical college ; and

2. that a period of not less than three months should be devoted to its study, which should include neonatal paediatrics and growth and development of the child.

PSYCHOLOGICAL MEDICINE

A significant contribution towards a recognition of the need for a reorientation of medical education and medical care has been made by advances in knowledge in the sphere of those sciences which throw light on human behaviour and social relationships, such as, psychology, anthropology and sociology. The understanding of psychosomatic phenomena has already become indispensable to medicine. Sub-Committee II, which considered the teaching of psychological medicine, was of the opinion that undergraduate instruction in this subject in India was wholly inadequate and that there was need for a substantial increase in the amount of instruction given in it. It was suggested that the teaching of this subject should be divided into three parts, each of which was to be undertaken at different stages of the curriculum including the pre-clinical and clinical periods. In the opinion of the committee 74 systematic lectures and lecture demonstrations were necessary altogether ; these were to be divided to the different aspects of the subject at different stages of the curriculum. It was emphasised that lectures in psychosomatic medicine should be integrated with other lectures in medicine. It was considered desirable that each student should put in a period of ward and out-patient work in the Department of psychiatry of a teaching general hospital. The Sub-Committee was of the opinion that there should be at least 12 psychiatric beds in every teaching general hospital to provide different types of cares of neurosis for teaching purposes.

There was general support at the Conference to the idea that the teaching of psychological medicine should be strengthened considerably. It was pointed out that psychiatry formed a major subject in the curriculum in many countries and that its teaching commenced from the time of the student's entry into the medical college. One of the major trends in the teaching of this subject is the emphasis on a psychological orientation of the student through a co-operative effort in which all the professors, clinical and non-clinical, participated. The view was expressed that, while a separate department for the speciality was desirable it might not be practicable at the present time in view of the paucity of teachers.

Taking all these matters into consideration, the Conference passed the following resolution :—

The Conference considers that, towards a psychological and psychiatric orientation of the medical student, teachers of non-clinical and clinical subjects can also contribute a great deal in addition to the contribution made by the psychiatrist and that, in undergraduate teaching, such orientation of the student is more important than the actual content of psychiatry which he is taught. It, therefore, recommends :—

1. that teachers of Embryology and Physiology should emphasise the influence of function on structure and the influence of stress and anxiety on conditions associated with homeostasis, and with digestive, cardiovascular and neural physiology ;

2. that the psychological and sociological influences in illness should be stressed by the respective professors of Medicine, Surgery, Obstetrics and Gynaecology, and especially Paediatrics ; and

3. that the following tentative suggestions to be considered as part of the training programme in Psychiatry :—

(a) 10 lectures on Psychology to second year students ;
(b) 10 lecture-demonstrations on personality in the third year ;
(c) attendance at neuro-psychiatric and paediatric clinics ;
(d) 12 lecture-demonstrations in a good mental hospital ; and
(e) participation, during the field work organised by the Department of Preventive and Social Medicine, in the study of mental health problems.

POST-MORTEMS

In considering this subject, Sub-Committee II noted that the number of post-mortems available for study was grossly insufficient in most of the teaching institutions in the country. The bulk of bodies available for post-mortem examination were the bodies of destitute with considerable decomposition set in before autopsies could be performed on them. In Appendix 9 to its report the Sub-Committee had analysed the factors responsible for this serious state of affairs and had made certain suggestions for improvement. The Sub-Committee felt that some kind of legal provision was necessary and recommended, as a first step, that legislation should be enacted to permit post-mortems to be performed in teaching hospitals in all cases in which a proper diagnosis could not be made ante-mortem. This legislation could be extended later to all deaths occurring in these institutions. The Sub-Committee emphasised that the real way to achieve the desired objective was to educate the public regarding the importance of autopsies in arriving at correct diagnosis and in contributing towards the progress of medicine. The Conference, therefore, considered that doctors could play a decisive role in educating the patients' relative and that a great responsibility rested on the medical profession to educate the people to understand the value and importance of post-mortem examinations.

During the discussion emphasis was laid particularly on the need for cultivating a spirit of " Post-mortem-mindedness " among the clinicians. One delegate graphically described post-mortem as a measure intended to protect the patients interests, although his relatives were apt to consider the permission they gave for its performance as a concession to the morbid curiosity of the doctor. It was suggested that while efforts were being made to increase the number of complete post-mortems, extensive use might be made of partial post-mortems and viscerotomes to increase the amount of material available for study. Further, it was felt that the inclusion of medico-legal post-mortems for studies in pathology and the appointment of a coroner in

all large cities would help to increase pathological material for teaching purposes.

The Conference then passed the following resolution :—

In view of the present utter inadequacy of post-mortem examinations and in view of their importance for increasing accuracy in diagnosis and thereby promoting the growth of clinical acumen and an improvement of the teaching of medicine, the Conference recommends :—

1. that the clinical staff should make every endeavour to educate patients and their relatives in regard to the value and importance of post-mortems and to persuade them to give their consent to such examinations, when considered necessary ; and

2. that legislation be promoted to make it possible that, in teaching hospitals, any death in which a definite diagnosis of the disease is not made can be subjected to post-mortem examination when considered desirable by the hospital authorities.

LIBRARIES AND MUSEUMS

The Conference discussed in some detail the role that libraries and museums should play in the education of a medical student. Libraries perform an important part in the process of self-education by the student and it is necessary to teach him how to make use of his library. Sub-Committee II, which considered this subject, drew attention to the need for providing qualified librarians to all libraries and for keeping the libraries open outside the teaching hours, at least 15 hours a day. The Conference was unanimous in supporting these suggestions. During the discussion the question was raised about the establishment of a Central Medical Library and an associated library service. Some delegates felt that such a library might result in a retardation of the growth of good libraries in the different medical colleges in the country. They suggested instead that Central Libraries should be established on a zonal basis and that there should be an interchange of books and periodicals between these zonal libraries. The Conference emphasised the need for the training of an adequate number of medical librarians.

Museums were regarded for long as one of the methods of didactic education. A good museum is really " a library composed not of books but of things themselves about which books are written ". There are various methods of organising museums for different subjects in a medical institution. Sub-Committee II expressed the view that museums could be utilised for introducing a group system of teaching, especially in colleges where the student-teacher ratio was not high.

During the discussion it was pointed out that there should be a certain measure of standardisation in the arrangement of exhibits in Museum Service might be established with a view not only to the standardisation of museum methods but also to the rendering of assistance and advice to the authorities of other museums. Such a service could also provide a pool of surplus material to facilitate an

interchange of such material between institutions and to provide specimens to newly established medical colleges. The service might maintain an uptodate catalogue of museums and also run a journal to disseminate knowledge on museum technology.

The Conference did not adopt any resolution on the subject of libraries and museums.

HISTORY OF MEDICINE AND MEDICAL ETHICS

The Conference recognised the importance of including the history of medicine and medical ethics in the undergraduate curriculum and recommended that specific provision should be made for teaching these subjects. A course of lectures on the history of medicine would help to place the picture of modern medicine in its proper perspective and to indicate how much the development of the physical and biological sciences has contributed to the interpretation of health and disease and to a wide expanison of man's powers to prevent sickness, to limit its ravages when disease has actually set in and, above all, to advance the cause of positive health. The humanising influence of a course in the history of medicine must be great because it brings home to the young medical student the high ideals and principles of medical ethics which actuated the leaders among the physicians of ancient India, Greece, Rome and Arabia in the practice of their profession in the service of the people. In addition, in so far as India is concerned, a study of the history of medicine has special importance ; the patient's description of his ailments is often in terms of ideas based on our indigeneous systems of medicine and the doctor, if he is to interpret correctly what a patient tells him, should be familiar with such ideas.

The Conference suggested that provision should be made in the curriculum for 12 lectures in the history of medicine and 12 lectures on medical ethics. No resolutions were passed on these subjects.

PREVENTIVE AND SOCIAL MEDICINE
ABSTRACT OF THE DISCUSSION

Dr. Carl Taylor

I feel that my job has already been done. The gracious speeches yesterday morning and a crescendo of previous discussion has pointed towards the present moment when I am hoping we will be able to take decisions. In fact there has been so much talk that I am a little worried. I am afraid I detect an undercurrent of doubt in some of your minds as to why a subject should suddenly receive so much publicity. May I make reference to that profound book of Philosophy

" Alice in Wonderland " ? You will remember the story of the Walrus and Carpenter walking along the beach :

" Oysters come and walk with us,
The walrus did beseech,
A pleasant walk, a pleasant talk,
Along the briny beach ".

The oysters trotted along to " Talk of many things, of shoes and ships and, sealing wax, of cabbages and kings. And why the sea is boiling hot, and whether pigs have wings ". I gather some of you think that our preventive medicine jargon makes as much sense as " shoes and ships and sealing wax " and " whether pigs have wings ". And some of you are afraid we preventive medicine wallahs will try to eat up all the time of the medical curriculum. I should like to clear away some of these doubts if I can and get us on to the job of making decisions.

First let us run quickly through and high-light the Basic Principles :—

1. Man is a social being, always part of a group. He should not be isolated from group just as one eye or genitourinary tract should not be isolated from the body. Basic unit is the family : in rural areas village is the important social unit.

2. Prevention is better than cure because it (a) saves from suffering and (b) it saves personnel, money and facilities.

3. The philosophy and point of view of Preventive and Social Medicine should become a reflex habit with every doctor whether seeing individual or group problems. Osler started in parasitology and pathology, became the greatest clinician of modern times, then in the last half of his career concentrated on prevention. Joslin in this generation become the world authority on the care of diabetes but now for the last 15-20 years has been concerned mainly with prevention of diabetes. We should develop in our students this habit of preventive thinking right from the beginning. If a doctor sees a case of typhoid in the home, he should automatically check the water supply before even accepting a drink himself from a pump which might be contaminated. Our students learn mainly by imitating the teachers they most admire.

I would like to make the following specific recommendations (adapted to local conditions) :—

1. We must have curriculum not course : Students come with idealism and service motive. They lose sight of these goals in a forest of bones or later become dazzled by the glamorous surgeons with their fabulous fees. We can maintain this idealism by following a continuing trail of preventive teaching throughout the medical college.

2. We must integrate preventive teaching with teaching of all departments. The logical time to think about prevention of cancer

is when discussing treatment of a case of cancer. This means we must educate the staff to preventive thinking. But even when they are educated it will still take some one to integrate the effort, it doesn't come spontaneously.

3. I believe it is wrong to think that Preventive Medicine will dissolve itself away. It won't eat you all up like oysters but it is here to stay. All doctors learn pathology and teach it, also pharmacology and physiology. This doesn't mean that we should do away with these departments. There is a body of specialized knowledge which requires special courses in the curriculum. Preventive and Social Medicine may be taught in a phased manner as follows : (See syllabus, Appendix 5, page 42)

(a) Pre-clinical Period : human ecology, clinical conferences, biostatistics and field surveys.

(b) Clinical Period : Environmental hygiene, epidemiology including applied statistics, and community organization and public health organization.

(c) Field Experience : family doctor plan, co-ordinated out-patient department service.

(d) Integrated teaching : with other departments of college particularly through the following subjects : Genetics, Nutrition, Medical History, Demography, Child Growth and Development, Mental Health, Maternal Health, Child Health, Communicable Diseases, Parasitology, Field Laboratory Methods.

4. There is the need for full time staff in each medical college consisting of Professor, Assistant Processor and Demonstrators.

5. The course should be a practical one. The Health Centre is really the laboratory. Work in Rural Health Centre should be considered essential. In the Urban Centre it may be optional. Students should become part of the village families. They can even be encouraged to take part in the social activities of the villages, for example, weddings.

6. Although unfortunate, it is but true, that special examinations are necessary.

I would like to conclude by saying that India should lead the world in the development of preventive medicine teaching because of the great heritage of preventive thought of Ayurvedic Medicine.

Dr. K. V. Krishnan

Dr. Sen told us that the hours allotted to preventive and social medicine are too many. I submit, Sir, that the number of hours allotted is certainly not too many. About 400 hours are necessary in view of the importance of the subject. Medicine today has three aspects—curative, preventive and social. In the training of a medical

student all these aspects need to be emphasised, specially the last two aspects since it is my belief that in future the practitioner will tend to be more and more a practitioner of preventive and social medicine. These hours are required because social and preventive medicine can be learnt not in the class-room but in the environment of the home and the community in rural and urban areas. Unless the student is allowed to spend many hours in these areas observing, surveying, investigating, drawing inferences and planning correct remedial measures, the training in social medicine would be ineffective. That is the reason why for imparting practical instruction and to bring about a correct outlook on problems, controlled community practice and health units are being recommended to be established by medical colleges and other training institutes where the students could be sent. Dr. Sen stated that social medicine is a nebulous thing. I do not think so. It may not be an academic discipline like anatomy or physiology but it is a concept, a concept that should be made to pervade throughout the entire medical training. Every clinical professor should present his subject not only from the curative but also from the preventive and social aspects. In order to enable this to be done, we must have a department of social and preventive medicine with the right type of professor who will be able to bring about a change in the attitude and approach to medical problems, both in the students and in the professors. I therefore submit that the teaching of preventive and social medicine is very important and steps should be taken to draw up a correct curriculum to provide sufficient number of hours and to create suitable facilities for training in the home and in the community environment and to make increasing use of the knowledge so gained for raising the standard of health of our people which is reputed to be low.

Dr. A. C. Ukil

I have been rather interested in this subject and during the last eight or nine years I am canvassing the support of many people for the inclusion of the subject in the curriculum. While the Calcutta University in 1952 approved of a tentative curriculum which includes this subject, it was found that sufficient funds were not available to provide an adequate number of teachers to teach the subject. I should like to offer a word of tribute to Dr. Taylor for working out carefully the curriculum which I fully support. I have, however, a few suggestions to offer. We should institute in the curriculum clinico-sociological conferences which could be held both in the hospital as well as in the field. I feel that every medical college should have a rural health centre to serve as the practice field to the student and I would recommend one also in the urban centre. These should be in the form of polyclinics staffed by general practitioners, obstetricians and other doctors belonging to the specialities besides medical, social and other auxiliary workers. The students at the health centre should take clinical case notes ; fill up the well defined schedules and case records

and then discuss the findings with clinic doctors who would be their teachers in this field. So far as the urban centre is concerned, the university student health service might be utilised for training with advantage. In order to surmount difficulties in the teaching of this subject, I am of the opinion that the professors and other teachers' posts in the department should be whole-time and non-practising. Unless there is a proper teacher-to-student ratio, no seminars or discussions which are essential would be possible. In the establishment of such departments the Central Government should also make a subsidy to these departments. Rural Health Centres could be suitably located in the community project areas or N. E. S. Blocks. The organisation should be developed to suit local conditions.

Dr. J. N. Karande

The students are overburdened with various subjects. They will appreciate and imbibe the principles of preventive medicine if they are given instruction in the subject after they have passed their final M.B.B.S. examination during the internship period.

Dr. L. V. Phatak

Since the subject of obstetrics is closely allied to Preventive Medicine, preventive Medicine should be taught along with obstetrics in the fourth and fifth years. This would be useful too to aid the welfare projects and rural training. This would be easy if the Department of Obstetrics has an association with the Maternal and Child Health work in the area and incidentally the students will have a chance of working in the larger Maternal and Child Health Schemes.

Dr. R. M. Kasliwat

Regarding the exact time of starting the teaching of preventive and social medicine, I believe it should be started right from the first year but taking out the students for practical training in rural areas should be started from the third year onwards and should be continued throughout the clinical years. It should also be continued during the post-examination period, i.e., the internship period when the students will have plenty of time to visit the rural areas and became familiar with the rural conditions of the places.

Dr. C. O. Karunakaran

If preventive medicine is not started right from the first year, the instincts of social service inherent in the students at the time of admission would die out. Therefore to cultivate and keep alive the spirit of service, social contacts of the students with rural families should be established from the beginning of their career. This is being successfully done in the Trivandrum Medical College. At least 25 per

cent. of the total period for preventive medicine should be allotted during the pre-clinical period.

Dr. K. C. K. E. Raja

The whole purpose as Dr. Karunakaran has put it, is to ensure that the spirit of social service, which is present in the minds of young people when they enter medical colleges, does not become eliminated with the learning of anatomy, physiology, biochemistry and other pre-clinical subject. It is therefore essential that the teaching of preventive medicine should start from the very beginning of their medical course. A suggestion in this connection from Dr. Taylor is important, namely that rural health centres should be established in association with medical colleges. If such a centre is created, not only would there be opportunities to the students for practical training, with the facility for medical-social work, but also for promoting research into rural health problems. This is important since the Conference has been stressing the need for so orientating medical education as to create some interest in the students in regard to research.

As regards statistics, it is desirable that a certain amount of training in this subject should be given to all students and that opportunities for higher training should be provided for those who desire to do so. It might be of advantage to have a combined course in statistics and epidemiology to be taken by students at a relatively late stage of their training period, provision being made for it as an elective course.

One of the purposes of our medical education system should be to train the student as a scientific worker and to prepare him for research. Another purpose is—and we are all agreed on it—that, after he passes out and enters on his professional career, he should be able to deal with both the curative and preventive aspects of medical care. This is particularly important when he works in the rural areas. For successful and intelligent participation in preventive health work and for research a certain amount of training in statistics is essential. All statistical concepts are based on mathematical theory and some training in mathematics is necessary for those who start the study of statistics, whether the data they may be called upon to deal with relate to medicine, agriculture, meteorology or any other subject. Unfortunately the students who enter out medical colleges have had, generally speaking, a wholly inadequate background of training in mathematics. As it is desirable that all students of medicine should have some training in statistics, the proper place for providing the requisite mathematical study is obviously the pre-medical stage. Those who take up higher training in statistics through the proposed elective course should have, I feel, some more mathematics as part of their training programme.

In should also like to raise one or two other questions for consideration by the Conference. In the college the student is trained under optimum conditions. When he goes out to the rural areas he finds

it difficult to get the specialised services available to him in the college in regard to diagnosis and treatment. He will have to rely mostly on his clinical acumen for diagnosis and on his powers of improvisation for providing treatment in spite of the handicaps he has to contend with. Would it be possible to devise a type of training in medical colleges to equip the prospective doctor for practice in rural areas ? I understand that, in Vellore, they are trying to make the students work under condition similar to those obtaining in rural areas. In my opinion experimental studies of this type are of the utmost importance and might, with advantage, be taken up by a few medical colleges in different parts of the country with their varying conditions of rural life. In working out such experimental studies it is suggested that the preventive medicine department should work in close association with the other clinical departments of a medical college. Such collaborative studies may help to promote, among other things, a fuller understanding of the needs of rural areas as well as to awaken the interest of the clinical departments in the preventive aspect of their activities.

Dr. S. T. Achar

I would start by asking the question, What is Paediatrics ? It sounds rather silly to ask such a question in a gathering of eminent doctors and teachers, but I have a suspicion, rather I would say it is my experience, that our framers of medical curriculum have not yet realised that present day paediatrics is something far more than it used to be when we teachers were students. I can say from personal experience, as a member of the staff of the medicine department of a medical college for many years, that we developed a tendency to give a dozen lectures on some of the diseases of children and called it paediatrics. To include a question or two in a medicine papers also appears to be giving a step-motherly treatment to the subject. The position with past were empirical. This and the newer knowledge of preventive regard to paediatrics all over the world to-day is that we have gathered a vast amount of scientific knowledge about the growth and development of the child, and about infant feeding practices which in the aspects of paediatrics have helped many Western countries to reduce the incidence of several disorders of infancy and childhood ; the children of the present generation in those countries are not only surviving in much larger numbers than ever before, but are better built than the ones in the past. The methods of history taking and clinical examination of children are different from those adopted for adult patients. To give some examples :— examination of throat of a child, looking for jaundice in a child, testing for weakness of muscles in a paediatric subjects etc. The general practitioner in his adult practice has to deal with these paediatric matters, several times a day, because a considerable proportion of his day-to-day work is among children of the families. Medical students have to be taught all these, since, after graduation, most of them will be general practitioners.

The second question is, what is the place of Paediatrics in the medical curriculum in the Western countries and what is its place in India now ? In U.S.A. Canada and Europe, paediatrics is regarded as a major clinical subject along with medicine and surgery for the medical undergraduates. There is a separate department and chair for paediatrics in every medical college, with a minimum of 3 months (often more) provided for this subject in the medical curriculum. In Russia, all general doctors are given basic paediatric training and they have a novel method of training some of the undergraduates for paediatric jobs by giving them a separate course in the clinical years (Paediatric faculties). In India, at present, as you can all see from the tabulated statement in the report of Sub-Committee II, the number of hours devoted to paediatrics in the curriculum varies from 12 to 86, the average being 64 hours. This is less than one third of the time given to paediatrics in Europe and U.S.A. My plea is that there is more reason for giving paediatrics a prominent place, in the curriculum here than in the West, because the conditions in India with regard to child care among the masses are far from satisfactory, that is so because of ignorance, age-long traditions and wrong practices and yet we have been giving much less time to Paediatric training to undergraduates up to now than in those more fortunate countries.

It is my experience that there is widespread interest among general practitioners in the subject and, where refresher courses are organised for them and for the child-welfare medical officers, as in my State, there is a demand for increasing the time allowed to paediatrics in these courses, as they feel that they did not have sufficient training in paediatrics during the undergraduate medical studies. There is, however, a lack of interest in paediatrics among many students in their undergraduate days, because they in general are examination-minded. In contrast, after graduation, every one of them wants to get a chance to work as a house physician in paediatrics departments where well organised ones exist, though it is impossible to take them all : obviously they and the general practitioners realise the importance of paediatrics in their day-to-day work after graduation.

I plead for the following in keeping with the present trends all over the world and with the needs of India :—

1. Establishment of an independent department of paediatrics in every medical college, with a Professor and adequate staff ;

2. A Minimum of 3 months to be devoted to the study of paediatrics, which should include neonatal paediatrics, and growth and development.

3. Either a separate examination in paediatrics be held in the final passing out examination or an alternative must be found to bring it on par with other major clinical subjects.

Dr. B. C. Roy (Chairman)

I would like to ask Dr. Achar that in the group of cases which will come to such a department, there would be cases of new-born babies which generally the obstetricians will claim that it is their privilege to treat. I am saying this particularly because even the best Paediatricians will not be able to understand the child in the first ten days of its birth. A very large number, say 50 per cent. of the diseases from which children suffer are diseases belonging to the infectious diseases group which are preventable diseases and medicine people are experts in this. I would like to ask to what extent a separate department will take over the newly born child and to what extent cases are referred to the infectious diseases department.

Dr. S. T. Achar

In Madras, where there is a department of Paediatrics, the teaching of neonatal Paediatrics is undertaken by the staff of the paediatric department both systematic lectures and ward-rounds-with the concurrence and active co-operation of the Professor of Midwifery. However, the care of the new born is a pigeon of the obstetrician. The students are taken round the wards by the Professor of Paediatrics when the registrar or the assistant professor in the department of obstetrics is also there and the student thus learns the problems relating to obstetrics also.

Dr. M. N. Sarkar

I thank Dr. Achar for suggesting that the new born infants will be looked after by the Obstetricians and that the teaching of the medical students will be done by the paediatricians. The treatment of newborn should always be in the hands of the obstetricians. The obstetrician is not only qualified to do so but he may also have a justifiable reason not to allow the paediatrician to handle the infant.

There are certain conditions when a baby is born which are only known to obstetricians. It might be perhaps a case of haematoma on the head. If my friend the paediatrician wants to demonstrate this to his students, the result might be that I shall lose the baby. The point I am making is that each one must know one's limitations and each must restrict himself to the particular department delegated to him.

It is my opinion that (1) a separate department of Paediatrics must be created in every medical college whether we have the staff now or not. We can have the necessary trained personnel in a few years' time since we are now training paediatricians ; (2) the students should not be allowed to become doctors if they did not have the requisite amount of training in paediatrics ; (3) I am not in favour of having one or two questions on paediatrics in the medicine paper ; we must have a separate test in Paediatrics.

Dr. J. N. Pohowalla

The paediatric work of a basic doctor, is about 40 per cent. of his total work as our child population consists of 2/5th of the total population. This fact alone shows that paediatrics needs considerably more emphasis than given hitherto, and I entirely disagree with those who claim that paediatrics should be taught as a post-graduate subject. It has got to be taught at the under-graduate level.

Paediatrics is neither an organ speciality nor a disease speciality. It is general medicine applied to an age group with problems peculiar to a growing organism. It is a subject in itself ; hence a separate department must be established at undergraduate and post-graduate levels.

The present student neglects paediatrics because he is aware that he is not going to be bothered with the subject in the examinations. Whatever be the nature of the examinations, as long as they are there, the student must be examined separately both in the theory and practice of paediatrics by paediatricians. He should be taught paediatrics for a period of three months.

It is only by giving an adequate training in paediatrics to our basic doctor that we may hope to make him play his part in improving the challenge presented by our country in the form of one of the highest neonatal, infant and child mortality.

I would appeal to you not on behalf of the paediatricians but on behalf of the general practitioners who need to know more on the subject than they have known in the past and on behalf of the children in this country to give this matter a little more consideration than what you have done in the past.

Dr. Achar's statement that post graduates feel the necessity for a refresher course in paediatrics suggests that this subject need not be emphasised during the undergraduate study. It should be the subject for specialists and post-graduate teaching particularly during internship.

Dr. B. C. Roy (Chairman)

I would still like some light to be thrown by some expert as to who would look after children suffering from infectious diseases *i.e.* whether the treatment should be by paediatricians, infectious diseases specialists or the physicians.

Dr. B. B. Yodh

The vast majority of children are treated by general practitioners and not by infectious diseases men. We had not given much time to infectious diseases in our medical teaching. I feel that this should be a paediatrician's job and not that of the infectious diseases specialist. No doubt, the physicians would lose some of their work but I would welcome it if the paediatricians take the responsibility of teaching paediatrics for a longer period than is done now to cover all aspects.

The main difficulty is, how it is going to be done in practice. How to get the professors of medicine and paediatrics to agree on the context of teaching to avoid repitition and overlapping since the general principles are the same whether the man teaching them is a Professor of Paediatrics of Medicine. In my opinion, Paediatrics should have a department of its own and three months should be devoted to it. The bulk of general practice is among children, and therefore, it is necessary to increase the present period of training. The conference should accept the recommendation of the Sub-Committee on this subject.

Dr. Subodh Mitra

Beforedeciding the allotment of three months for paediatrics in the undergraduate study, I think one should analyse the 900 hours allotted to medicine for the three clinical years to decide whether we could provide three months to Paediatrics in conformity with other branches of medicine namely, tuberculosis, leprosy, skin and venereology, infectious diseases, mental health, etc. If this is not done, it will be difficult to adjust the whole thing in the broader sense of medicine.

Dr. V. R. Khanolkar

This conference might consider one other alternative which is being tried in other countries such as the U.S.S.R. There, the training of the Paediatricians starts after 1½ years of pre-clinical study. Paediatricians are not trained first as general practitioners and later as specialists in childen's diseases but receive special training from the time they start the clinical course with emphasis on paediatrics and a background of general medicine, surgery etc. This alternative is well worth considering, if not now probably at some later date.

PSYCHOLOGICAL MEDICINE

Dr. B. C. Roy (Chairman)

I would call upon Dr. Govindaswamy to initiate the discussion. While discussing this question, I would like him to talk about not only the pathological states but also about the assessment of the mental condition in groups of persons like students, police-men and others who are exposed to stress and strain of different types.

Dr. Govindaswamy

I would suggest that the name psychiatric medicine should be substituted by psychological medicine and I hope the audience will give it the same sympathetic consideration that they have given to paediatrics.

I would like to emphasise that in all progressive universities, psychiatry forms one of the major subjects of the curriculum starting

from the very moment the student becomes a medical student and perhaps even earlier until he becomes a medical graduate. In Edinburgh and other places you will find a compulsory examination for this subject, but I would not urge for this yet in India. I would, however, like to stress the following points :—

Firstly, psychological and persuasive methods of treatment are much more effective than perhaps purely drug treatment in a very large number of cases. Secondly, every competent physician is also a psychiatrist. The psychological orientation of students is a co-operative effort in which all the professors—clinical and nonclinical should participate. A new integration towards this orientation can always be given to the student provided the teaching of this subject is associated with anatomy, physiology and the various clinical subjects. Ten lectures in psychology may be given in the second year followed by another ten lectures into the problems of personality. This approach will make the subject very interesting. The student can then be led on the subject of mental disorders. It is worthwhile for junior pathologist and for those who would like to be competent physicians to have some kind of special course in psychiatry. The sociological and psychological factors in a patient should be stressed by the surgeons, physicians, paediatricians, gynæcologists, etc. whom the student meets during the year. In all the clinical conferences and seminars it will be worthwhile if a competent psychiatrist is invited to participate. I would particularly emphasise that in the study of paediatrics the problem of psychology plays an extremely important part. I should be content if this could be integrated with the internship period although this may be a novel idea. In this manner it should be possible to develop a psychological outlook in the student and make the study of it an interesting and useful experience.

I suggest that this scheme be given a fair trial for a few years before it is finally accepted or rejected.

Dr. Vishwanathan

I would like to know from Dr. Govindaswamy whether he would recommend a separate department of psychiatry with a professor as its head for teaching undergraduate students.

Dr. Govindaswamy

A separate department with a professor would be very desirable but may not be practicable at the present moment. It may become practicable within a few years when the All-India Institute of Mental Health, Bangalore, sends out a number of specialists in this field.

Dr. Patel

There are 39 medical colleges in India. As far as our information goes, some seven years back we had one psychiatrist in the country. Now the number is round about 15 to 20 and therefore it is not

possible to man all the teaching hospitals with psychiatrists. I am in favour of establishing a separate department of psychiatry and I advocate that wherever the facilities exist and qualified psychiatrists are available, the department should be established. It is no use establishing the department without properly qualified persons and in case a department is established under the charge of a person without adequate qualifications it would be difficult to displace him later on when a proper person is available.

Dr. Kutumbiah

I agree with Dr. Govindaswamy about his moderate requirements. I agree with his suggestion that there should be a course of lectures on normal psychology, but I would like to have them given after the first M.B. during the first three months before the clinical studies begin. The difficulties in arranging for a course of lectures on mental diseases in mental hospitals should be realised in cases where the colleges are far away from the mental hospitals as in Vellore. I suggest that these lectures may be replaced by psychiatric demonstrations and attendance at the psychiatric out-patient.

Dr. M. V. Govindaswamy

Psychiatric departments must be created sooner or later in every big medical college. Every teaching hospital should have a psychiatrist on its staff and there must be psychiatric service provided in the out-patients department. I would drop the point about giving demonstrations on mental diseases but would concentrate on the teaching of psychiatry in the out-patient department.

Dr. B. C. Roy (Chairman)

So your proposition boils down to this that the student should go to the outdoor to learn psychiatry under a trained person and if there is no particular institution where the psychiatrist could arrange demonstrations, they need not be insisted upon.

Dr. Vahia

Most of the points covered here are included in our special note (Masani and Vahia).

Dr. B. P. Trivedi

The Goodenough Committee embodies psycho-pathology as a part of pathology. I as a pathologist shall welcome a psychiatrist to assist me in teaching psycho-pathology.

POST MORTEMS

Dr. P. N. Wahi

We all realise that the number of autopsies done in this country is very limited and there is a general unanimity of opinion among the teaching staff of medical institutions regarding the desirability of increasing the number of autopsies. In my opinion an important criterion for grading of a hospital should be the percentage of dead autopsies in that hospital. A legislation to do autopsy examinations on every dead body in the hospital would really solve the problem but it may not be possible to achieve this at the present moment as such a measure is likely to evoke public protest. However, an authorisation to conduct an autopsy examination on all bodies where the diagnosis could not be established is urgently required.

We should remember that the real way to achieve the objective is to educate the public regarding the importance of autopsies for the progress of medical sciences and in the diagnosis and treatment of diseases. The clinical staff have a special responsibility in this matter, for they are the persons who can take an active part in this education of the public. They should make a determined effort to obtain the consent of the relatives which otherwise would not be readily forthcoming. Indeed, they can demand this as their reward for the services they had rendered to the patient during his life.

I suggest that two steps should be taken immediately, namely, to include medico-legal postmortems for studies in pathology, and the appointment of a Coroner in all the large cities.

Dr. B. P. Trivedi

This is a subject in which I have interested myself since 1937. Now I will discuss my views under two heads, firstly, the availability of more post-mortems, and secondly, the utilisation of the post-mortems. With regard to the first, we can, of course, increase the number of post-mortems by legal enactment. To my mind this is too premature because to have legislation passed through the Legislatures you will have to educate the public, the MLAs. and MLCs. I do not know for how many years we will have to wait for the the enactment of such a legislation. The second approach will be to tackle this problem by the energy and the 'post-mortem-mindedness' of the clinicians. It is up to them to approach the relatives and ask for the post-mortems. How can we do it? The whole thing depends on whether we have earned the right to ask for this. If the patient's relatives feel that he has been well treated, if they know that the physician or surgeon came when the case was very bad in the middle of night, then the clinicians would have the right to ask them for this favour. If the nurses and the ward boys look after the patients well then and then only that atmosphere can be created in the hospital. My second point is the utilisation of available post-mortems. From my long experience

in the medical college I have come to the conclusion that neither the surgeon, who has treated the case for six months, nor the physician, the registrar or the house physician care to attend the post-mortem and verify whether their diagnosis was correct.

Dr. Alan Gregg

There is an easy way for me to express my point of view on post-mortem. I have an arrangement with my wife that if while travelling I am seized with something or other that results in my death she will insist on a post-mortem. This I do in self protection. If I am caught with some infection I will tell my doctor that I have this arrangement with my wife. If he is very good doctor he would be very grateful to me because at least I shall help him in the diagnosis of the next case. If he is a very poor doctor he will call a doctor a day earlier because he knows that there is going to be a check up. I have never seen a post-mortem widely described as a protection to the patient but it is exactly that. The post-mortem is often regarded as a concession by the family to the morbid curiosity of the doctor ; it should be thought of as a protection of the patient because it increases the pressure for curiosity of the doctor as well as contribute to the scientific knowledge.

Dr. B. B. Yodh

If the number of post-mortems in different colleges is taken into consideration it will be found that they vary considerably even in hospitals with the same bed strength. This is largely due to the interest or otherwise of the staff in obtaining post-mortems. This, however, is not enough. As a first step we must insist that all deaths the cause of which had remained undiagnosed should be subjected to post-mortem examination as a matter of routine. This can be extended later to all deaths. When the public is properly educated it will be easier to enact legislation. In the meanwhile partial post-mortems and extended use of viscerotome will help to increase the material available for study.

Dr. B. C. Roy (Chairman)

The consensus of opinion seems to be that post-mortems should be undertaken in the interest of the physician. What is happening to-day is that before the post-mortem is done the consent of the relatives has to be obtained. Usually notices are sent to the relatives of the deceased given them 24 hours to remove the dead body. If no claim is made then only post-mortem is possible. Even so, there are difficulties in doing the post-mortem at the right time. We get over this by injecting the dead bodies with formaldehyde immediately after death and then it is quite convenient to wait even for 36 hours before the body is claimed ; the body is still preserved for post-mortem after this period in the humid climate of ours.

LIBRARIES AND MUSEUMS

Dr. H. N. Bhat

Every medical college worth the name has some sort of a museum and usually more than one museum. The importance of a museum in the teaching of medicine has been recognised and it plays the same role as lectures or library. I feel that there should be a certain amount of standardisation in the museums, especially of exhibits. For example in the pathology museum should the arrangements be system-wise or disease-wise. In the museum it is essential to keep not merely the specimens but also related material which will enhance the value of the museum such as case sheets, temperature charts, miniature X-rays, etc. This type of arrangement in the museum will be acceptable to most of the medical schools. The second point I wish to make is that there should be a Central Board of Museum Service which should also maintain a standard museum. The Board should render assistance and tender advice to the authorities of other museums and also undertake to supply museum specimens to them. The service could maintain an up-to-date catalogue not only of its museum but other affiliated museums also. The Service can run its own journal where matters relating to museums can be discussed. The Central Board should also undertake training of technicians in the collection, preservation, display and cataloguing of specimens.

Dr. D. Govinda Reddy

I agree generally with Dr. Bhat. In some of the Universities there is a tendency to close down the museums and they consider that museums are not desirable because the students spend more time in the study of preserved specimens rather than studying fresh specimens. In my opinion, it is very desirable to have up-to-date museums in medical institutions. The institutions should exchange their material and offer their own surplus material to new medical colleges so that they may develop their museums for teaching purpose within as short a time as possible. Museums are necessary because some of the diseases not found in that particular area can be represented in the museum to give the students the necessary idea of that disease.

Dr. C. S. Patel

There exist now in most medical colleges museums of anatomy, pathology, hygiene, toxicology and pharmacology and they are expanding every year. There is a possibility that further expansion will take place in the next few years as more funds become available for the purpose. Similarly, each medical college should have an adequate sized library where all essential and historical books are made available. I would not favour the establishment of a Central Library at one place only as this would take away the impetus to establish very good libraries in the States. India is too big a country and I feel Central Libraries and Museums should be established zone-wise.

All large cities should have Central Libraries and there should be zonal interchange between them.

Dr. B. C. Roy (Chairman)

The establishment of a Central Library should not really retard the growth of provincial libraries and as Central Library will have more funds, many books can be brought into the Central Library which would not ordinarily be available in provincial libraries.

Dr. P. N. Wahi

I like the suggestion made by Dr. Bhat regarding the establishment of a central museum in the country, especially from the point of view of its acting as a pool for surplus material and for distribution of specimens to newer medical colleges. The latter find it difficult to equip their museums owing to paucity of post-mortems. The concept of central museum is on the same basis as Central Registry of Pathology. We have at Agra for the last 3 years established an All-India Registry of Hepatic Pathology and over 400 cases with complete history and tissues, blocks and sections are registered there. These include a good number from abroad. This material is available for study and research to any worker. This registry is being broadened and four more such registries are being organised in this country, namely, Tata Memorial Hospital, Neuropathology Unit at India Cancer Research Centre, Nutrition Research Laboratories, Coonoor and School of Tropical Medicine, Calcutta.

Dr. P. V. Gharpure

There exists a Museum Association of India and I believe there is also an International Association. We should develop a similar Museum Association for medical subjects. The Association should provide information through pamphlets on the lines of the Welcome Foundation. Secondly, I suggest that there should be a Diploma Course on the subject dealing with Museums. I understand the Baroda University has got a diploma course in this subject.

Dr. B. B. Yodh

This conference should recommend that training of medical librarians should be taken up seriously so that each medical college library may be provided with a qualified librarian. We should also recommend that the library should be kept open for at least 15 hours in the day.

Dr. Kurulkar

On the question of libraries, special attention must be given to the fact that it is not enough to merely add books to the libraries. The students should have the facilities for learning how to make use of the libraries and how to collect references. This can only be done if every

library is placed in charge of a well qualified librarian who could guide the students in the proper use of the library.

Dr. B. C. Roy (Chairman)

There seems to be general agreement that libraries and Museums should be developed in each State and in each medical college to the maximum possible extent. There should also be a registry of diseases associated with museums. There should be an exchange of material and ideas between different libraries and museums. Either directly or through operation of a Central Museum Board or Library Board as the case may be. There should be adequate staff in the library to direct the students how to use it.

HISTORY OF MEDICINE AND MEDICAL ETHICS

Dr. B. C. Roy (Chairman)

I shall be satisfied if this Conference thinks that there should be more provision for the teaching of history of medicine and medical ethics. In my opinion there should at least be twelve lectures on the history of medicine and twelve on medical ethics.

Dr. D. Subba Reddy

The Bhore Committee, the University Commission as well as the First World Conference on Medical Education in London discussed this question. There has been increasing interest in this subject. Prof. Sigerist specially urged that history of medicine should be taught in India for four reasons. I summarise them below :—

1. To bring about a better understanding of the evolution and development of medicine in India, where there is a sort of national awakening and an attempt to revive the indigenous systems. This course of lectures will show that there is no rivalry between the two systems.
2. A course of lectures on history of medicine will educate the student to appreciate the old environment and historic forces leading to discoveries and the gradual changes in our methods, techniques and theories in medicine.
3. History of medicine, is a discipline by itself. It will make the student realise that medicine is constantly changing and never static and that he must constantly observe, test and prove, anything that is before him. The lectures help him to think *scientifically*.
4. Presentation of historical development of a subject makes the entire course interesting and inspiring and makes the student strive for higher ideals and prepares him for the role of a *Humanist*.

I quote the following statistics relating to the teaching of history of medicine in the United States of America in 1939. Out of the 77 medical schools, 54 (70 per cent.) schools were giving regular courses and 28 schools required the students to attend the lectures. In 1952, out of 86 medical colleges in the U.S.A. and Canada, 22 colleges had departments of history of medicine. In 14 colleges, lectures were given by other departments interested in history of medicine. In 8 colleges, the lectures were given not in the college but in the University or in other colleges. In this manner, 44 colleges out of 86, have lectures in history of medicine.

I therefore suggest that every medical college should have six to twelve lectures on history of medicine, some as introduction to the preclinical, some at the commencement of clinical course and some at the stage of "internship" to round off his education.

Where there is no department of history of medicine, any staff member interested in the subject, with some training and visits to a department of history of medicine, may give a course of lectures. Where no member of staff is interested or competent, a qualified or trained lecturer in history of medicine may be invited to give lectures, until some one takes up the work. Every department can give two or three lectures on the history of the subject with which it is concerned. A survey of the status of history of medicine in Indian Medical colleges and the facilities existing may be undertaken immediately with a view to organise the course of lectures wherever that is possible and to provide facilities and technical assistance by lectures and material.

Dr. A. C. Ukil

I would plead for the inclusion of twelve lectures in the curriculum on history of medicine and twelve lectures on medical ethics. There is a good deal of social justification for this subject. However, in the initial stages, there may not be any examination in these subjects. Later on, when financial provision and suitable teachers are available, perhaps a full-time professorship and a separate department could be created for this purpose.

Dr. Carl Taylor

The Sub-Committee too considered at great length the need for presentations to students in medical ethics. This was to be in practical form as part of the suggested Introduction Course to cover the first two or three months of the start of the clinical period. This is shown on page 75 of the Sub-Committee's report where one hour a week is allotted—total 8 to 12 sessions. This includes, in addition to medical ethics, a matter of word 'courtesy' especially how to get along with the nurses.

CHAPTER VII

Methods of Teaching

The teaching programme in medicine is in the process of considerable reorganisation in many parts of the world. The emphasis is shifting from presentation of a formidable array of facts in the form of didactic lectures to the development of initiative and independent thinking on the part of the student. The teaching programme is being so fashioned as to present to the student a proper understanding of the living organism built around structural and functional characteristics of cells, organs and organ systems. Such teaching necessarily involves the crossing of departmental barriers and evolution of integrated teaching. The Conference spent considerable time in discussing teaching methods and considered the problem under two items : (i) Lectures, Demonstrations, etc. and Integrated Teaching ; and (ii) Internships.

Lectures, Demonstrations, etc. and Integrated Teaching

Sub-Committee II noted that didactic lectures given at present in the medical colleges did not serve much useful purpose although there were some exceptions. The Sub-Committee, however, recognised the place and value of systematic lectures in the medical curriculum provided they were prepared carefully and supplemented by a judicious use of audiovisual aids such as slides, charts and models. While thus pleading for a revitalisation of didactic lectures, the Sub-Committee also suggested that their number should be curtailed in all subjects. Instead, it was recommended that lecture demonstrations, student seminar, group conferences, etc. should form the main pivot around which the bulk of teaching should revolve. One of the main purposes of medical education is to impart an understanding of man as a whole in health and in diseases and this is being defeated daily by the compartmentalisation of the medical curriculum. The Sub-Committee, therefore, emphasised the need for an integrated approach to the study of medicine by blending together the teaching of the now rigidly separated disciplines of medicine into a unified experience for the student. The teaching programme should be so adjusted that there was a natural flow from one subject to the other. The curriculum should be so planned as to emphasise the understanding of human biology in terms of structure and function, growth and behaviour. The Sub-Committee suggested in broad outline both in its report and in apppendices 10 to 13 the manner in which integration of teaching could be initiated in this country and gave examples of the integrated curriculum in force in a few medical colleges in India and abroad.

There was unanimity of opinion at the Conference that the existing system of teaching was unsatisfactory and needed considerable

improvement. The Conference, however, took care not to suggest any set patterns of teaching methods but only indicated the broad principles on which each institution could build its own system. It was pointed out that although didactic lectures might in future play a diminishing role in medical education they should not be abolished altogether. By laying proper emphasis on the different facets of a problem and by making their presentations interesting, stressing all the time the gaps in existing knowledge, didactic lectures could provide an inspiration for the student and guide his thinking. It was suggested by one delegate that, as in some foreign countries, attendance at systematic lectures may be made optional.

The Conference was unanimous in supporting the value of lecture demonstrations and group teaching. During the discussion on integrated teaching some of the difficulties in achieving total integration were referred to, such as paucity of trained teachers, the teaching load and the system of examinations. The Conference, however, felt that even with the existing resources and in the light of improvements that were likely to be made in the over-all system of education following this Conference, attempt should be made from now onwards at achieving integration. A beginning could be made in this direction by planning the lectures and lecture demonstrations given by the teachers of the various departments in a co-ordinated manner. The value of seminars and group conferences in achieving integration and the place of tutors or preceptors, who could be placed in charge of small groups of students, were emphasised. The appointment of a member of the clinical staff on the pre-clinical side for teaching purposes and *vice versa* was suggested to facilitate integrated teaching. It was, however, pointed out that in some universities, it was found difficult even to integrate the teaching of anatomy and physiology, let alone the teaching of preclinical and clinical subjects. In these universities, anatomy was taught on a regional basis while physiology was taught on a systematic basis and except in the case of endocrines, central nervous system and the special senses it was found difficult to co-ordinate the teaching of anatomy and physiology. Another difficulty raised at the Conference in the way of integrated teaching was the paucity of teachers. To overcome this, it was suggested that selected students could be given some teaching responsibilities and the idea of 'Participative Teaching' was put across. It was suggested that this method was tried and found successful in some countries. One of the principles of participative teaching was "Each one teach one".

Internship

Sub-Committee II regarded internship as a step forward in the training of a doctor in providing him opportunities for coming into personal contact with patients. The Sub-Committee recommended a rotating type of internship in which a student was to spend three months in each subject in the following manner :—

(a) Medicine ;
(b) Field internship (rural or urban) } Compulsory

(c) Any other subject such as surgery, obstetrics and the specialities as desired by the intern.

The Sub-Committee further stated that provision of residential accommodation and a stipend was essential for the interns and strongly favoured the internship programme to be made the responsibility of the universities as it constituted a part of the educational requirements.

The Conference endorsed in general the above-mentioned views of the Sub-Committee. There was general agreement that internship was a continuation of the education of the student and constituted the most valuable year in his education. The feeling was unanimous that internship should be for a period of one year, although it was realised that some institutions had to limit the period to six months because of lack of hospital beds. It was emphasised that wherever facilities in the teaching hospitals were not sufficient to provide for all those who are to undergo the internship course, military and district hospitals should be utilised for the purpose, care being taken to ensure that these hospitals possessed an adequate number of qualified teachers in each case and other requisite facilities.

With regard to the distribution of the work of an intern between the various departments, some modifications were suggested to the schedule drawn up by Sub-Committee II. All were agreed, however, that, whether the internship period was for six months or one year, work for a prescribed period in a rural health centre should be made compulsory.

The question of the status of the intern in the hospital organisation elicited considerable discussion. It was pointed out that an intern should be regarded merely as a senior student. The intern should be a whole-time worker with a definite responsibility placed on his shoulders. It was also pointed out that the programme should primarily aim at an intensive training of the intern rather than at getting service out of him for the hospital. The recommendation was made that interns should be provided with residential accommodation in the hospital or in the rural health centre and that they should be paid a suitable stipend.

With regard to the legal status of the intern, a suggestion was made that he should receive his degree after passing the final M.B.B.S. examination and that he should be registered temporarily during the internship, final registration being done at the conclusion of internship.

In order to get over the shortage of teaching staff a delegate made an interesting suggestion whereby interns are to be taken in batches at intervals throughout the year instead of all being admitted simultaneously for their training. By a system of graded authority, the senior interns are to teach the junior ones. It was pointed out that, under this system, it was desirable to give the first batch of appointments to the best students of the year.

The conference did not pass any formal resolution on this subject.

ABSTRACTS OF DISCUSSIONS

TEACHING METHODS

Lectures, Demonstrations etc. and Integrated Teaching

Dr. B. C. Roy (Chairman)

There are two different types of teaching, the didactic and practical. It is important to consider to what extent in the curriculum of medical studies didactic teaching should form a part. Dr. Wig will start the discussion.

Dr. K. L. Wig

I may at first say a few introductory words about the methods of teaching. Methods of teaching will vary with local conditions. What is suitable in one institution or country may not suit another and may not even be feasible there. Methods of teaching will depend on what our objective is. If our objective is to produce general practitioners, the methods will have to be adapted towards that end. If we want that there should be a rural bias, because the general practitioner will have to work in the villages, we will naturally have to depend upon methods which lay stress upon the clinical diagnosis and the modes of treatment feasible in the rural areas where facilities for detailed investigations will not be available. The pattern on the other hand will be different if our main objective is to teach students who, at a later stage, may become either general practitioners or specialists or research workers.

Coming to details, didactic lectures have become rather unpopular during the last few years. Much is being often said against them. While they may in future play a diminishing role in medical education, I am not in favour of their abolition. I think they will always serve a useful purpose. If a lecturer is capable and knows his task, he can make his lectures really interesting. Books cannot serve the same purpose. They can often be confusing for a fresh student. Experienced lecturers can stress the right thing, give selective information and guide the student to think on right lines. Lectures can be made more instructive and attractive by the use of aids like films, slides, charts etc., though such aids should not be used to the extent of completely overshadowing the lecturer.

Lecture-demonstrations and group teaching can certainly serve a highly useful purpose and can in certain respects be more instructive than lectures. These and certain other similar methods, however, need much more staff than is available at present in most of the colleges. Each institution should adopt these methods to the extent it finds them feasible within its own limited means.

It is impossible to go into the details of the various methods and techniques of teaching. A big conference like this cannot in fact take

decisions on individual details. The Sub-Committee which considered the teaching methods has made some excellent suggestions. I suggest that these suggestions and recommendations be studied closely by the universities. They should adopt as many progressive methods as they find feasible. The medical faculties of the universities should appoint Sub-Committees to assess the results of modified methods of teaching. Valuable information as regards the relative merits of these methods can then be placed before some future conference. This Conference, as well as the proposed Sub-Committees, should tell the governments, which run the various colleges, that there is an urgent need to improve our teaching methods and that this can only be achieved if the staff of the institutions is increased considerably.

As regards integration of teaching, it has to be admitted that it is at present sadly lacking. Not only there is very little integration among the basic and clinical departments, but there is also no real sign of integration between the various clinical departments. In fact, even in the same subject, the specialists keep on going into all sorts of details as regards their own specialties, unmindful of what the student actually needs. It is sad to note that sometimes there is no integration even between the two units of one department. While details cannot be discussed, especially as conditions will vary from institution to institution, I suggest that before the start of a session and before the start of any main item like a series of lectures, demonstrations etc., there should be a conference of teachers where programmes of teaching should be chalked out and methods of integration decided.

I would like to make one more suggestion in connection with the integration of teaching in basic and clinical subjects. The basic subjects should have at the Asstt. Professor's level—but not at the professorial level—some member of the staff, who has had a good deal of clinical training and who has some clinical bias. This will help in keeping up the clinical outlook in the teaching of basic subjects.

Dr. Ukil

This Conference ought to lay down certain criteria regarding teaching methods—Didactic, Practical and Correlation teaching; otherwise the universities would not be able to form an opinion. For example, if it is accepted that one didactic hour should correspond to 3—4 practical hours, then the universities would understand what staff would be needed to offer adequate correlated training. Most of the medical colleges are inadequately equipped, understaffed and the staff inadequately paid. These factors were pointed out several years ago by Dr. Alan Gregg and Professor Hill. Again, in order to promote correlated teaching we may have to train the teachers and some guidance has to be given on this by the Conference.

Dr. G. K. Karandikar

The Conference needs to discuss teaching methods seriously, especially because "How to teach Medicine" is knowhere taught, it

has always to be learnt. Dr. Carman's warning yesterday that we do not hold degrees in education may here be supplemented by the fact that persons who teach "teaching" have nothing to offer us in this matter either.

Sub-Committee II and its study group therefore looked into teaching methods like lectures, demonstrations, seminars etc. in general and into integrated teaching in particular. We felt, as Dr. Wig said, that no set methods can be prescribed for all; and the methods for a place or for a teacher must of course be decided locally and personally. However, some discussion can be done here.

The problems of teaching methods concern students of whom we get two kinds. Students who come to learn and those who are sent to be taught. For the learner all that a teacher need do is to create and maintain an environment conducive to learning. As for those who are sent to us to be taught the problem is of making them learn. For both students, however, today it would appear that the only motivation comes from examinations.

The Sub-Committee felt that for good education this motivation must be altered. "Becoming a good doctor" must be made (must be "sold" as) the motive not by urgent appeals repeated during lectures etc., but by making everybody—teacher and student—see and feel how each different activity in the teaching programme helps to make the student a doctor as a whole. It is in this context that integration is spoken of, and there, the *distinctions like preclinical* and *clinical subjects vanish.*

The Sub-Committee found a great deal of confusion in people's understanding of the term "Integrated Teaching." Some senior persons helped us to clarify the issue.

If only one teacher could teach all medicines needed by the undergraduate, things could be very simple. But medical science has grown so much that this is not possible. Therefore, we must divide our work of teaching. However, even if we must employ many teachers to teach, the ultimate target is one the students' mind. There, the diverse sources and points of information must of necessity register as one Whole. Where this can best be done is termed integrated teaching. Integrated teaching, therefore, is that ideally harmonised programme of teaching which a team of teachers hope to achieve. Obviously there are difficulties in evolving such a co-ordinated integrated programme and these difficulties vary from place to place and from teachers to teachers.

Therefore the Sub-Committee felt it best and most helpful to put forth three programmes from three sources. All these programmes recognise the difficulties. The main ones are : the number of teachers even the mere quantity is deficient, let alone the quality of teachers—the teacher : student ratio must be improved. Also there must be freedom for teachers to experiment.

I would lastly touch upon Dr. Wig's point about integration between pre-clinical and clinical staff. I draw attention to the recommendations of placing a member of each preclinical department formally on the staff of a clinical department and *vice versa*. This will aid easy access of teachers to various teaching areas like the wards etc., which access is necessary but not always and everywhere possible today.

The Sub-Committee feel that despite the difficulties each institution and each teacher and group of teachers can and should attempt more and more co-ordination which will ultimately achieve integrated teaching.

Dr. Kasliwal

Didactic Lectures have a definite place in the teaching methods provided the lectures are made interesting and are not mere repetition of book work from typed or hand-written notes. If the students feel that they are getting something new in such lectures they will like to attend them but in my opinion these lectures should not be made compulsory. On the other hand, more emphasis should be given to tutorial classes and lecture—demonstrations and clinics by providing more staff than is available at present. I understand in many institutions in foreign countries, particularly in America, didactic lectures are optional.

Integrated Teaching.—In order to achieve a thorough and full integration of teaching a much larger staff would be required and the existing system of examinations will have to be greatly modified. But in my opinion in the beginning partial integration may be introduced with advantage so that a student gets some connected picture between the pre-clinical and clinical subjects ; at the end of lectures in a branch of a pre-clinical subject by a member of the preclinical staff, a few lectures may be given on the related clinical problems of that system by some member of the clinical staff. Similarly when clinical teaching in a particular subject is being conducted in wards and lecture-demonstrations, an integrated and correlated picture with regard to pathology, pharmacology and therapeutic aspects of that subject should be presented together with teaching of applied physiology and applied anatomy in respect of that particular clinical subject. In my opinion it will not be right to introduce complete integration of teaching at all levels in all medical institutions. This system of teaching has to be tried out first. Partial integration should be introduced in some of the institutions and the result of such a teaching scrutinised. Of course, even to introduce partial integration successfully, increase in the existing staff will be required.

Dr. Chandy

So far every one has been saying that for lack of teachers and lack of time and departmentalisation, for example in paediatrics and

other subjects, integration becomes difficult. My own feeling is that integration can be done without too much difficulty with the present staff that is available. Very many colleges take didactic lectures in the third or fourth year. There can be four series of lectures. Take for example the diseases of liver. The Physician first gives a certain number of lectures. After that, some lectures may be given by the Surgeon, then a few lectures by the Pathologist and so on. In other words the student gets in his own mind an integrated picture of the whole disease and of the system or the organ. In such a teaching all the specialists in the hospital and college will be participating. So far as drawing up the curriculum is concerned all the staff of the college should sit together and decide how many lectures each one has to give and on what days and on what subjects. This programme should be fixed two or three months earlier. By doing this, everybody will be giving lectures in such a way that these can be organised without too much disruption of the present system.

Dr. M. L. Chakravarti

I have heard so much about integration. Integration is no doubt helpful for better teaching. The point is how to achieve it. We have found difficult even to integrate the teaching of anatomy and physiology. This is because anatomy is taught at least in the Calcutta University on regional basis whereas physiology is taught on systemic basis. We have, of course, found it possible to integrate the teaching of nervous systems, endocrines and special senses. So, it is necessary that some light is thrown on this subject by the Conference. It appears to me that unless the number of didactic lectures is decreased and number of teachers also increased, integration would be difficult.

Dr. B. B. Yodh

I am afraid if we were to go into details we shall end up in greater confusion than what exists at present, and that is the reason why in recommendations of the Sub-Committee II only some broad general ideas have been suggested. As integration is a difficult subject, I suggest that we should go slowly and start with group studies, student seminars and may be, staff seminars as our first step. I think integration is not impossible if we increase the number of teachers to students by three times and we will be able to do it in the curriculum hours that have been suggested.

Dr. Carman

I should like to refer to 'Participative Teaching.' Having the student to participate is another method of teaching which has been tried and found successful. It has also interested many students in teaching. Many speakers have spoken about the tremendous need of more teachers. We can learn from the specialists in adult education one of whose principles is "Each one teach one". I would suggest

the trial of the plan of student demonstrators to supplement the work of the senior and junior teaching staff. This has been tried elsewhere. It can be a very fine "Elective Project" for quite a number of students and may lead to an increased interest in and knowledge of and experience in teaching.

Dr. Thangavelu

Teachers assume that they are fountains of wisdom and knowledge and that all students should quench their thirst from these fountains. An experiment conducted in the Trivandrum Medical College has proved the contrary. The students are guided to participate in teaching. After an introductory course of didactic lectures on general principles of the subject, the students are divided into teams of four. The subjects for group teaching are announced earlier and the four in each team prepare for teaching—they prepare their own charts etc. The value of this method of teaching was assessed by a group of teachers and headmasters who were invited as observers during one of the participative sessions. This method is particularly valuable in : (i) Mobilising the abundant latent teaching talent in the undergraduate ; and (ii) Achieving a greater degree of integration in teaching. The teachers of various specialities come as invitees and they also participate in the programmes.

INTERNSHIPS

Lt. Col. C. K. Lakshmanan (Chairman)

I will now call upon Dr. Wig to open the discussion.

Dr. K. L. Wig

Almost all are agreed that internship is a necessity. So one need not dilate on that point. The Medical Council of India has permitted two types of internship—a 6 months' internship or one year's internship. One year's internship is no doubt preferable. However, there are certain difficulties in adopting it. The number of teaching beds in many of the States is limited. If we adopt one year's internship, the number of interns getting training at a time will be double of what it would be if the period of internship is six months. That naturally reduces the number of beds available per intern and may thus, if the beds are already few, nullify the very purpose of internship. Military hospitals and district headquarters hospitals should also be utilised for the purpose of internship, but at present most of the district headquarters hospitals are not suitable from this standpoint. The staff often does not contain the minimum number of experts needed for guiding the interns and the distribution of beds is often too imbalanced for the purpose of internship. However, the governments concerned should be requested to ensure that the deficiencies in the district hospitals are made up, so that it may be possible to utilise the hospitals for this purpose and adopt the system of one year's internship.

As regards the distribution of the training period, I agree that internship in medicine should be compulsory, as medicine would be the main subject which the student will be concerned with as a general practitioner. The suggestion of training in a rural health centre is also very welcome, considering the fact that our ultimate aim is that medical men should develop interest in rural health and should work in rural areas. The rest of the period should be left to the choice of the interns. Women doctors for example may like to work in the gynaecology and obstetrics wards, and men students may not like to spend much time there, but on the other hand, may like to get training in surgery or some other speciality.

Lt. Col. C. K. Lakshmanan (Chairman)

If you look into the document you have got you will find on page 6 thereof that the recommendations are that the internship period should be one year out of which instruction in medicine will be for three months, rural field practice for three months and the rest of the period should be left to the candidates themselves to choose. Is there general agreement on this ?

Dr. Kasliwal

Internship must be considered as an essential part of a continuous process of medical education and the internship period of one year is perhaps the best and ideal one. The Medical Council of India had already made it clear that a college can opt out for five years' course with six months' internship or 4½ years' course with one year's internship. However, in order that internship for one year may be effective, adequate facilities for training must be provided. Many States and many medical colleges in the country are not in a position at present to provide such facilities. In fact I am of the opinion that the intern should be reckoned as a sort of junior house-surgeon and be given full responsibility and not considered merely as a senior student. If therefore, adequate arrangements for imparting this type of practical training do not exist, it would be much better to adopt the six months internship period until such time effective practical training can be provided for the full period of one year.

As regards the distribution of various subjects for training, I suggest that the internship period should be of a rotatory type and I recommend the following distribution :—

Medicine with paediatrics . . .	two months
Surgery with ophthalmology and E.N.T. .	two months
Public Health with rural experience .	two months
Midwifery and gynaecology Maternal & Child Health . .	one month

Dr. Ukil

I am in entire agreement with the recommendations of Sub-Committee II on the subject. I am of the opinion that during the internship period the student should be a whole-time participant in the programme. To do this effectively, the interns should be provided residential accommodation and should also receive an adequate stipend and free board. Further, there should be provision for temporary registration during the period of internship itself in order to facilitate the hospital duties, which they are called upon to perform, from the legal point of view.

Regarding rural practice and field training, since a whole team of teachers has to be on the spot to conduct the training of interns for tnree months, I suggest that arrangements for residential accommodation for groups of students and teachers should be made by the government in the rural areas. The rural health centres which are to be multiplied a great deal in the Second Five Year Plan can be utilised for this purpose.

Dr. Patel

The Medical Council of India enquired of the various institutions the possibility of introducing internship programme for a period of one year which is the ultimate objective of the undergraduate training. The replies received showed that due to inadequacy of existing number of hospitals it was impracticable to introduce such a programme uniformly. We find that in some States facilities for a twelve months' programme do not exist. I then approached the Defence Department who agreed to throw their hospitals open for selected interns. Our ultimate objective of internship should, of course, be for one year but to begin with, the institutions where adequate facilities exist may be given the choice of six months' internship. The Medical Council had laid down the details regarding both types of internship and they should be followed. Whatever type is enforced, work in rural areas must be considered essential.

Dr. Subodh Mitra

In places where the medical course covers five years as in Calcutta University at present the internship should be for six months ; but in places where the course is for $4\frac{1}{2}$ years the internship should be for one year.

At present the internship is simply an eye-wash. To keep a student engaged only for 3 to 4 hours is to waste the most valuable time of a student's life at the beginning of his career. I would insist that interns should be whole-time residents. In that case arrangements for accommodation and honoraria should be made and there must be sufficient provision for this purpose made by the Government through the universities.

Dr. B. B. Yodh

This Conference should look at the question of internship from the educational point of view. The decisions taken here will not be binding on anybody present here immediately. Therefore, the Conference should place before the authorities what they consider to be the best. It was correct that the Medical Council of India permitted the latitude of one year or six months' internship according to the conditions prevailing in each area, but as far as this Conference is concerned a unanimous opinion regardnig one year of internship will strengthen the hands of the administrators in persuading their governments to accept the recommendations of this Conference. Rural health training should be made compulsory. We should also recommend that the universities themselves should control the internship programme as it is a continuation of medical education.

Dr. B. B. Dikshit

I entirely agree with the previous speaker. The internship should be for one year and the interns should do all the work that comes to district hospitals whether it is medical, surgical, obstetrical, etc. There should not be any separate periods for surgery, for medicine and so on. In my opinion the question of provision of boarding, lodging and stipend should be left to the respective universities and States.

Dr. P. C. Nambiar

I am of the opinion that the period of internship should be one year distributed as follows :—

Medicine	Three months
Surgery	Three months
Obstetrics and Gynaecology . .	Three months
Rural and Field Experience . .	Three months

During the three months' experience in medicine, the interns should attend skin clinics, etc. and during the three months in surgery they should attend Eye, Ear and Nose Department, etc. With regard to the use of district hospitals, I would suggest that there should be three specialists in each district hospital : a physician, a surgeon and an obstetrician and gynaecologist. There are large district hospitals in most provinces and if they are not large enough they should be expanded but want of accommodation or want of facilities or some such excuss come often whenever proposals are made for advance. I think these are not valid excuses and difficulties can be overcome. since the Central and State Governments are anxious to do everything they can.

Lt. Col. Sangham Lal

In Madras the internship programme will begin in 1957 and it has been decided that district hospitals are to be used for training during

internship. Three months of the internship period will be given for work in public health in the field in collaboration with the Health Officer and Health Centres.

The point as to whether one year's house-surgeoncy should be insisted upon after internship may be clarified by this Conference. The Madras University is going to insist on house-surgeoncy as a condition precedent for registration for post-graduate studies.

Dr. S. C. Sen

I have only two observations to make. If stipend and residence are granted to the interns some of the difficulties will be removed. So far as I know internship is really an internment in the hospital. In my opinion an internship should really mean an internment in hospital or the institution for the entire period, the intern being on duty for 24 hours except for off-duty hours. His time should not be wasted. Another point which I would like to emphasise and which has not been apparently discussed by the Committee is the legal status of the intern. His legal status should be properly defined. He should get a Degree after passing the final M.B.B.S. examination and be temporarily placed on the medical register and on completion of internship be placed on the register permanently. The practice today varies in different universities. There should be a certain amount of uniformity all over the country.

Lt. Col. D. P. Nath

I agree with Dr. Yodh that the period of internship should be one year and that our recommendations will strengthen the hands of the health departments and universities in providing suitable facilities for this programme. A point has been raised regarding the facilities for the internship programme. During the Second Five Year Plan period we are going to provide a large number of health centres and are going to upgrade the facilities of medical relief at district hospitals ; these institutions will therefore be suitable for training. Residential accommodation can also be provided without much difficulty. One thing which I would like to stress is that I feel that the emphasis during this period of internship should be on the training of the intern and we should not try to get service out of him for the hospital or the health centre.

Dr. Melkote

I would like to raise three points. Regarding the course of study, according to the present system, the duration of the internship period and preclinical study are inter-related. Whenever there is insufficiency of beds the internship is reduced to 6 months and the preclinical studies are increased correspondingly. I feel that preclinical subjects should be kept at $1\frac{1}{2}$ years and the interchange should take place between the clinical and internship periods. I should like this to be

done because teaching of a little more theory in the clinical period would be more advantageous than increasing the preclinical period.

My second point is that the period of internship may vary according to the availability of facilities but registration of graduates or even the conferment of the degree should be made uniform all over India. If this is not done it would lead to considerable administration difficulties in the selection of students and would lead to plenty of public controversy.

The third point is that students should have training in rural problems. A few rural centres where residential accommodation, sufficient staff and equipment are available showed be established with mobile vans, etc. This is absolutely necessary if our students are to study and assess the rural problems properly.

Lt.-Col. Amir Chand

I would like to say something about the point raised by Col. Sangham Lal. Internship is a pre-registration training while house-surgeonship is a post-registration training. Internship should be compulsory for registration.

Dr. Sarkar

We are trying to copy U.S.A. or Canada and introducing internship but we should first find out its utility to our students. As a resident in one of the American hospitals I had the opportunity to see the interns' work and they were no better than the fifth year students since they had no responsibility.

Dr. Alan Gregg

There are two systems of managing an internship programme. One takes all the interns of one class in at one time once a year. The other is to take ¼th of the interns on July, 1, a second quarter of the interns on October 1, the third quarter on January 1 and the last quarter on April 1. Each intern serves for a full year. By grading authority, by seniority each intern can learn from those longer in service and help to guide and help those who are junior to him in length of experience. It is wise to give the first appointment each year to the best student. Thus an internship can be made into a teaching device. Appointing all the interns contemporaneously loses this kind of internal teaching effect.

CHAPTER VII
Examinations or Assessment

Sub-Committee III, which was entrusted with the task of preparing the background document on this subject, stated that the present system of examinations was unsatisfactory, that the failure rate in examinations was abnormally high and that drastic remedies were needed to improve the situation. In addition to the prevailing methods of examination, several other factors were responsible for this situation, such as insufficiency of adequately trained staff, methods of instruction and methods of selection of students. The Sub-Committee gave specific consideration to the possibility of eliminating examinations altogether and of devising alternative methods of assessing the student's work, but came to the conclusion that there was no system of assessment which was infallible, and that there was no other satisfactory method to replace the examination system. The present examination system consisted of three parts, written, clinical and/or practical and oral. The Sub-Committee recommended that this system should be allowed to continue for the present. At the same time it was realised that the emphasis on the written part of the examination should be reduced in future and that increasing emphasis should be laid on a day to day assessment of class-work. This system should be introduced gradually and completed within a maximum period of ten years, the ultimate purpose being that 50 per cent. of the marks in the final assessment should be allotted to class-work. The Sub-Committee also presented a scheme of assessment which included credit to class-work in addition to the conventional types of examinations and made certain suggestions regarding the number, spacing and conduct of examinations, which in essence followed the existing pattern.

Sub-Committee II, on the other hand, suggested far-reaching changes in the examination system, which are as shown below :—

1. Written portions of all examinations should be abolished altogether ;
2. 50 per cent. of the credit in the final examination should be allotted to the progress registered by the student in his day-to-day work, taking at the same time, a comprehensive view of his entire progress.

The Conference discussed this subject at great length. Although there was unanimity of opinion that the existing system of examinations was unsatisfactory and that improvement of the system was inextricably linked with the changes in several other aspects of

medical education, there was a cleavage of opinion on the changes in examination that should be introduced immediately. This cleavage more or less reflected the different view-points of the two Sub-Committees.

Those who supported the recommendations of Sub-Committee II stated that a complete change of outlook on the system of assessment was an urgent necessity. It was pointed out that students were admitted to medical colleges to-day on the basis of competency tests and presumably the best students entered the colleges. Inspite of this the fact that 80 per cent. of them failed at one time or the other during the medical course was, they pointed out, most disheartening. They stated that an important cause of the high rate of failure was that students were working all the time only for examinations and not for enriching their minds with knowledge and experience. Written examinations acted as a barrier to the acquisition of knowledge, strained and taxed the memory of the student and failed to ascertain with precision the extent of knowledge the student really possessed. The supporters of this view suggested that no harm would be done if written examinations were abolished altogether and urged that in their place, a system of periodical assessment of the progress made by the student should be devised. It was pointed out that we in India had inherited the examination system from the British and that, even in Britain to-day there was considerable anxiety on the part of the teachers and educationists about the real value of the written examination. There are many countries in the world, such as Scandinavia, Germany, Italy and Spain, where written examination stopped at the matriculation stage, nevertheless, the doctors trained in these countries are in no way inferior to those who have had to undergo written tests.

Those who supported the stand taken by Sub-Committee III emphasised that they were not opposed to the principle of giving due recognition to the value of a system of assessment of the day-to-day work of the student. What they wanted to impress upon the Conference was that such assessment required a large number of qualified teachers and that it was not practicable to introduce this system in the immediate future. They, however, suggested that a beginning could be made by introducing credit for day-to-day assessment to the extent of 10 per cent. of the total marks in the final examination and then gradually increasing this percentage. They warned, however, that this type of assessment was beset with a number of dangers and difficulties, such as the existing inadequacy of trained teachers, the possibility of a relegation of responsibility of assessment by professors to inexperienced juniors and the element of bias, favouritism and prejudice.

Some of the delegates who supported the conservative attitude of Sub-Committee III were of the opinion that written examinations could not be entirely dispensed with either at present or in the future. According to them written examinations served a useful purpose in testing many qualities of the student. They tested the power of expression of the student and his ability to marshall facts and present

arguments in a cogent and logical manner. They acted as a powerful incentive to work and the discipline imposed on the student by written examinations had, on the whole, a beneficial influence on him. Some students, if given time to think as in a written examination, were capable of presenting good answers to the questions they were asked, but they might fail to acquaint themselves satisfactorily, often due to nervousness, in practical and oral examinations. They also argued that, while written tests might provide the memorising of facts, the development of a good memory an asset of great value to the future medical practitioner. Taking all these matters into account, these delegates were emphatic in their opinion that written tests should not be abolished altogether. They also pointed out that the successful working of a system of periodical assessment of the progress made by a student required a large number of whole-time and adequately paid teachers, who should be independent of outside influences and endowed with a high sense of honesty and integrity of purpose.

A number of other points were brought out during the discussion. It was stated that the examinations were often conducted at present in great hurry and that the examiners had too little time to go through the answer books. Some delegates gave their impressions of the relative merits of various methods of assessment but there were few factual data on which these impressions were based. It was therefore felt that there was ample room for experimentation in this field.

As the discussion drew to a close one of the delegate offered certain remarks in clarification of the views put forward by Sub-Committee II. He said that it did not advocate the complete abolition of examinations ; what it had emphasised was the need for a change in the methods of examination. He further said that the Sub-Committee did not suggest that all their recommendations should be accepted immediately. It was realised that the right type of teachers was required in adequate numbers before the proposed reforms could be carried out. At the same time it was essential that a beginning should be made without delay. It was not a matter of giving 10 per cent. more marks or 30 per cent. less marks for day-to-day assessment, he said. The discussion ended at this stage with the following remarks from him. 'We appoint our teachers, I hope, with great care. If we allow them to teach our students, surely it will be fair to let them be trusted to examine our students. Why run this country on the basis of distrust ?'

The Conference then passed the following resolution : "This Conference is unanimously of the opinion :—

(a) that the present methods of examinations and assessment are unsatisfactory :

(b) that written examinations require considerable modifications :

(c) that much greater importance be given to the day-to-day assessment of the student during the period of study than is being done at present :

(d) that it is necessary that scope should be given to experiments in assessment by such medical colleges as are willing to undertake them."

ABSTRACT OF DISCUSSION

Assessment

Lt. Col. C. K. Lakshmanan (Chairman)

I would now request Dr. Sarkar to present his views on assessment of students.

Dr. Sarkar

The deliberations of the Sub-Committee which was asked to carry on this task have been circulated. I wish to point out that while drastic change is needed we have to avoid extremes. We have to consider whether a number of written examinations should be held periodically and what should be the mode of our examinations. Our recommendations are already before you. They are dependent on certain conditions, such as the existing premedical qualification of the students, the type of the future doctor we are going to produce and the courses of study we are going to adopt in the curriculum. While we feel that the written examinations, as they are distributed to-day, might be considered as detrimental to the progress of the student during his training we do believe that time is not yet ripe to do away with them altogether. We also feel that if a modified type of examination is evolved it should be only at a time when a new curriculum has been devised and introduced. It has been suggested that professors and teachers under whom the student is working should keep an eye on day to day progress of the student and guide him at the same time on right lines when he is found deficient in any particular subject. This in my opinion pre-supposes that we have the right type of teachers and instructors in adequate numbers. You will also see in our recommendations that we do not recommend holding of examinations in each speciality, though we felt that in a subject like ophthalmology examination may be needed. You will also note that during the period of internship we have not recommended any examination except in a subject like forensic medicine. We have recommended that there should be external examiners and that the students should be examined in their own environment as far as possible. Before I close, I must say that we cannot enforce our recommendations on you but before our recommendations flounder on the rocks of your discussion I plead they should be given due consideration they merit especially in view of the difficulties which we have pointed out in adopting the newer concepts which had been recommended by Sub-Committee II. Our recommendations therefore should be regarded as an interim measure.

Dr. B. B. Yodh

The Sub-Committee II thought it very necessary to go deeply into the question of assessment and examinations because their recommendations regarding the methods of teaching, integration, etc., all depended on the system of assessment and examinations. The Sub-Committee felt very strongly that what was required for the country at the present moment was the necessity for a complete change of outlook on medical education by most of our medical educators and we are happy to find that such change is taking place because of influences both in this courtry as well as abroad on newer type of education. It is necessary to remember that unless the academic atmosphere is of a high standard in the institutions, unless the teachers are trusted and unless the students realise that they are there to learn their subjects and not only to pass examinations, there will be no real progress. We select the best students with high academic qualifications for medical studies, and then to find that 80 per cent. of these fail at the end of the course is disheartening. An important cause of the high failure rate is that students are being prepared for examinations only. Their memory is taxed at each examination with the result that the memory fails in many cases. It would be much better if at every stage in the course of medical studies we have a system of assessment by which we can test the progress of the student from time to time. Then, if a student is not progressing properly and if we find he would not improve, then we might advise him to leave the college and in such cases the earlier he does the better. As to how to achieve this periodic assessment during the course of training is a matter which could be left to the universities. They could devise their own methods for the purpose. I realise that the recommendations of the Sub-Committee II are of an ideal nature. Nevertheless I feel they should be tried for a few years at least. I, therefore, recommend that we abolish written examinations without doing any harm to the medical education at all and do the assessment of the students in the manner indicated in the report of Sub-Committee II.

Dr. K. V. Krishnan

I would like to place before this Conference some of the observations we have made during the past three years at the Institute on the relative merits of the different types of examination, written, practical and oral. Without going into details of the methods adopted, I may give here our results only. We have found that oral examination plus the quality of class work more often gives a more accurate assessment of the standard reached by the student than the other methods of examination. Practical and written examinations are helpful but too much emphasis should not be laid on these. The former is open to chance and the latter is often perhaps due to cramming. We now give greater importance to class work and oral examination. This we find is very helpful to the students. The students learn better and do better. This does not mean that I do not recommend written examination at all. What I do recommend is that less emphasis be placed on

written examinations. Though we may conduct all three types of examinations, due to various reasons, in arriving at the final assessment, greater emphasis should be paid to the oral examination and class work.

Dr. B. P. Trivedi

After hearing the inspiring speech from Dr. Yodh, I have decided to open my lips. Dr. Yodh has said that we have become too much examination obsessed. The oral problem is to find honest examiners. I would insist that the written examination must remain and in my view 60 per cent. should be given to the written and 40 per cent. to the day to day work of the student.

Lt. Colonel Amir Chand

Written examinations in my opinion act as barriers to the acquisition of knowledge. They have a deleterious effect on the minds of the student and produce a fear-complex. They should therefore be eliminated altogether. If that is not possible for some time little importance should be attached to them. In their place greater importance should be given to the *viva voce,* practical and clinical examinations. Assessment of the knowledge of theory can be better made in an oral examination in which a large ground can be covered, questions can be varied and there can be cross-questioning all of which is not possible in written examinations. The present professional examinations held at different stages of training lead to departmentalisation. They should therefore be discontinued. There should be only one examination on the completion of training in which all subjects should be taken up in their applied form as they pertain to the theory and practice of medicine. Substantial credit should be given to day to day class work in all subjects in this examination and at least 50 per cent. of the examiners should be external.

Dr. C. Raghavachari

I rise to supplement the remarks of the Chairman of the Sub-Committee III. We all agree with Sub-Committee II with regard to the ideal to be aimed at but we feel that the time is not yet ripe to force the pace and entirely do away with examinations. We secured the views of a number of teachers in the Universities and in making our recommendations we worked on the material we had in our possession as replies to our questionnaire. The alternative to University examinations is the assessment of day to day work and to give credit to this in the final assessment of the students. The dangers and difficulties likely to come in if we adopt this method are : (1) the inadequacy of trained teachers ; (2) the possibility of relegation of responsibility of assessment by professors to juniors quite incompetent to shoulder this responsibility ; and (3) bias, favouritism, prejudice, partiality, etc. and (4) want of uniformity in standards of assessment. All the same we feel that something must be done to change the

present system and shift the importance from examinations to training. We recommend, therefore, that in a period of five to ten years from now, we must have 50 per cent. of the marks in final examination set apart for credit given to day to day work.

In the joint meeting of the Sub-Committees, the place of written examination in the final examination was discussed and it was agreed that the importance given to this should be reduced. I wish to draw attention to the opinion expressed by Mr. Ian Aird in the World Medical Education Conference that "written essay method of examination served a useful purpose in testing many qualities of the student and should be retained". The Sub-Committee III also recommend that number and spacing of examinations during the course could be left as it is at present.

Dr. S. C. Sen

I would like to stress the importance, though not undue importance, of examinations. Examination papers have their values and must not be dispensed with. At least, its negative value in determining the misfits and units must be realised and appreciated. While assessment of day to day work must be given due recognition, this assessment must also be done by external examiners. The large percentage of present-day failures in the examination is perhaps due to the temper of the examiners. It is no doubt usual to outcry the gift of memory but even if we may have jokes about the forgetful memory of the professors and appreciate their gifts of forgetfulness, we must realize and appreciate the gifts of memory and its necessity for doctors. I feel that with proper selection of candidates, revision of curricula, better methods of teaching, proper selection of teachers, the bugbear of examinations, the high percentage of failures will disappear.

Dr. K. C. K. E. Raja

It seems pretty clear to me that the divergent views expressed here can be reconciled only on the basis of factual data. I, therefore, feel that this is a field where there is ample room for experimentation. In adopting a system of periodical assessment without formal written examinations it is desirable to keep in mind the need to make the process of assessment to unobtrusive as not to create anxiety in the mind of the student. Assessment must become a byproduct of studying the student by taking advantage of the many opportunities for contact with him which the teacher has during the training period. Such a process of assessment can perhaps be evolved only as the result of experiment. In this connection I should like to refer to a remark made by Dr. Alan Gregg regarding the selection of students for admission to medical colleges. He said that Medicine offers perhaps the widest field for the inclusion of different types of talent in view of the variety of channels into which health activities have tended to ramify. He therefore pleaded for a not too rigid system of selection based on a limited number of criteria and urged for some

latitude by admitting a few who fell outside the usually accepted standards of suitability for admission. This idea may apply equally to the question of assessment. If a variety of talent be desirable from the point of view of promoting sound medical care for the people, then the process of assessment to select those who would become available at the end of the training period should be done with due care not to eliminate desirable ones among the students. This is yet another reason for experimental studies in assessment.

While there is undoubtedly a strong case for eliminating written examinations from the medical course, it cannot be denied that a written test helps bring out a proper assessment of certain qualities of the student which an oral or a practical test may fail to reveal. There are other ways than examinations to achieve this purpose. For instance, a thesis based on an independent study undertaken by the student would help bring out these qualities.

Dr. B. D. Khanna

Several objections have been raised regarding written examinations, that they are tests of memory and that the students tend to concentrate on certain subjects and that the teachers teach only these subjects but nobody suggested what the advantages of a written examination are. Examination covers a wide field of knowledge. They test the power of expression of the students and their ability to set out facts in a logical position. They act as incentives to work and successes in the examination give a sense of confidence in one's ability. The discipline of an examination has a beneficial influence on the student. In the Armed Forces Medical College, we have written examinations and fortnightly tests. The latter are conducive to sustained effort and regular habits. The examination is conducted by a board of three persons one senior professor and two juniors one of whom is not connected with the training of the students. This Board sets the questions. The junior officers being associated with the examination get the necessary training in the methods of examinations.

Dr. C. S. Patel

I am in agreement with the recommendations of the Sub-Committee III. There are many hurdles to cross before we start the credit system to the extent of 50 per cent. although I appreciate its importance. Before we introduce the credit system it is absolutely necessary that the staff of the medical colleges should be whole-time and no person on the staff should be allowed private practice in any form. The staff should be adequate enough and the ratio of the student to teacher should be of the order of 1 : 4. I appreciate Dr. Yodh's statement and will certainly agree to the abolition of examinations when proper atmosphere and ideal conditions, as he described, prevail in the country. To-day the conditions of teachers in India are unsatisfactory. They often grudge and grumble and show utter lack of interest. They are not in a proper frame of mind at present. We have, therefore, to provide sufficient whole-time

adequately paid staff independent of any influences, people of honest and integrity before we radically change the present system. I suggest that we make a beginning by giving credit system only to the extent of 10 per cent. and gradually raising it to 30 per cent. We should not try to put the cart before the horse.

Dr. S. J. Mehta

I am in entire agreement with Dr. Yodh that under ideological conditions, examinations should be abolished but till that stage is reached, I should suggest a compromise and that is there should be only two examinations—one at the end of the pre-clinical period and the other at the end of 4½ years. The Intermediate examination held at the end of three years for pharmacology and pathology should be abolished and incorporated in the final examination. Dr. Raja has asked : what are the causes of failure ? In my opinion, some of the causes are : 1) difficulty of getting senior examiners who have a large experience : 2) the time given to the examiners to assess the answer books which he has got to see, over and above his other duties, is extremely limited. However sincere he might be, sometimes it is impossible for him to go through these answer books within the scheduled time.

Lt. Col. Sangham Lal

Almost all are agreed that there should be examinations for the present. Everyone will also agree that the present system is not ideal. It is capable of being improved and should be improved. The methods of examination and teaching certainly require reorientation. Teachers and examiners must do some heart-searching for some of the defects in the present system. It must be mentioned that examiners receive a large number of answer books and the time allotted for assessment of these books is insufficient. I would like to submit that it would be much better if the examiners told the universities that it was not possible for them to assess the answer books within the prescribed time rather than do the work haphazardly. Lastly, I was completely amazed when I read the report of the Sub-Committee II. Whereas they want religiously to stick to the competitive examination in respect of selection of candidates for entrance to medical colleges, they want to do away with the examinations altogether in the final assessment of the students. Entrance examination for admission is given top priority while for the final examination, it is not considered worth anything at all.

Dr. H. B. N. Swift

I am glad to find that many of the speakers have mentioned that the system of examination has nothing to do with all the failures. It is said that the written examination can only test the memory aspect. I am doubtful if in a medical examination, memory power should not be tested. After all, if you want to test the reasoning power of the

student this is a matter of how you frame the questions. One knows of instances when students do well in the written examination but fail miserably in *viva voce*. The state of nervousness of the students will be responsible for this. This nervousness might be absent during the written examination which is for three hours and when the examiner is not standing in front of the students. I would, therefore, urge that there should be a written examination, a *viva voce* examination, and assessment of day to day work.

Dr. P. C. Rakshit

The percentage of passes in the examination is very variable. It ranges from 40 to 70 per cent. for the first MBBS examination, 90 to 95 per cent. in the second MBBS, and 30 to 85 per cent. in the final MBBS. I am, of course, quoting from memory. Dr. Yodh's suggestion is an ideal one but I feel that the warning issued by Drs. Sen and Patel regarding the personal factor in assessment by the college staff are very important. I want to stress that we do not have the properly trained staff in adequate numbers and the assessment will be relegated to junior lecturers or demonstrators. Again when there is more than one college under a university, it is unsafe to give the assessment powers to the staff as they are likely to be misused for obvious reasons. I would suggest that the question papers should be so drawn up as to include a large number of questions and the candidates asked to answer a proportion of them up to a total of 100 marks. I would also suggest that 20 per cent. of the marks be allotted to class-work in institutions where there is no other rival institution under the same university. Regarding examinations, first and final MBBS may be conducted by university and the rest of the subjects may be taken by the college staff at the college level.

Dr. Kasliwal

I shall confine my remarks to the written part of examination. I am of the opinion that written examination forms an essential part of the examination by which we can find out the best in a candidate and pick up the good type of students. Besides, these examinations provide an impetus to the student for a short period of intensive study and give him a practice of putting facts in writing in a logical way. In all competitive examinations, such as I.A.S. due weightage is given to written examination. In postgraduate examinations, such as M.D., M.S. or M.Sc. I understand that written examinations will remain. If we abolish written examinations for undergraduates, we shall deprive them of an essential part of this training. How can we expect such students to take up examination in which written part of examination plays an important part later. We may give more emphasis to clinical and practical part of the examination but at no future date do I envisage doing away completely with written part of the examination.

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During the last 50 years I have either been a victim to the existing system of examinations or have victimised others to it. It is on the basis of this experience that I should like to review the discussion which has taken place during the last two days. I venture to suggest that there has been some confusion of ideas in the minds of some of the participants and it is necessary to make certain matters quite clear. The Sub-Committee does not advocate the abolition of all examinations. What they are suggesting is a change in the method of examinations. Further, they are not advocating an adoption of their recommendations immediately. What they are recommending is that certain objectives should be aimed at by those who are entrusted with framing the policies of medical education and the teachers who would be called upon to implement them. As has been rightly pointed out by Dr. Patel there are two very important consideration :

1. That there should be an adequate number of teachers in medical colleges, and

2. That there should be some full time teachers in all the major subjects. Knowing the conditions prevailing in our country, I am convinced that unless these aims are constantly kept in mind, we shall never achieve any improvement, however much we may alter the medical curriculum. If we begin working towards the objectives I have mentioned even from to-day I venture to think, that in a reasonable period of time we shall have an adequate number of teachers, full time teachers, and teachers who possess all the wonderful qualities which have been expected of them, during the course of discussions this morning.

I happen to be unfortunately connected with a disease which is a serious disease and a serious disease demands radical treatment. I submit that experts who are gathered here should think about the serious condition of medical education in India and not in terms of minor remedies, 10 per cent. more marks here or 10 per cent. less marks there for passing examinations. I may be permitted to point out that we have copied the present system of examination in India from the U. K. and have been greatly influenced by what has happened there. As you probably know, even in that contry teachers and medical educationists have begun to get very worried about their system of examinations. I may quote one sentence from an editorial in the British Medical Journal of July the 16th this year :

> " Hitherto, the developments in medicine have meant simply the imposition of new subjects resulting in a crowded, jostling curriculum, with the student amassing facts rather than absorbing knowledge, learning more but understanding less and allowing examinations to assume an unhealthy dominance over his work and thought. "

If this is true in the U. K. where there is probably an adequate number of teachers and many full time teachers, you may well imagine

what must be happening here, where there is such a shortage of teaching staff and hardly any full time teachers in clinical subjects.

The second question which deserves your attention is that the system of examinations which we have adopted from the U. K. is almost peculiar to that country. In most of the European countries, particularly Scandinavia, Germany, Italy, Spain, and France, the written examinations stop at the matriculation stage or what corresponds to it. After that stage there are only *viva voce* or practical examinations. I need not point out that the doctors in those countries are in no way inferior to the doctors in countries which have an elaborate system of written, practical, and oral examinations, as in the U. K. and Commonwealth countries.

One other thing I should like to mention. Let us be a little more logical. We appoint our teachers, I hope, with great care. If we allow them to teach our students, surely it is only fair to trust them with the examination of their students. Why run the country on a basis of distrust? This is an attitude characteristic of administrative departments but should not prevail in academic circles. If an examiner is no good get rid of him. If a teacher is no good let him try something elsewhere he could be much more useful to the community. It is time for trusting our teachers. I understand that in the next Five Year Plan, the Planning Commission is seriously thinking of allocating funds for five full time units in some of the medical colleges. I think we need not wait for a long time and it should be our recommendation even to-day, that the rigidity and inflexibility in the system of our examinations should be removed. Dr. Raja has suggested that there may be scope for experimentation. That is one way ; there are many other ways. It is time that we thought in terms of the future of our country which is on the threshold of great things. Let us think a little boldly even though it may be unpleasant to us at the present moment.

Dr. Subodh Mitra

I agree that the burden of examinations should be lightened and I also agree with Dr. Khanolkar when he said that the rigidity and inflexibility of examinations must be done away with. There are discrepancies in the results of examinations in different universities ranging from 30 to 70 per cent. Why should there be such a discrepancy? I think full assessment of failure should be done by the authorities of the universities and medical colleges. Regarding external examiners, I have found a great difficulty in securing their services. I therefore suggest that 25 per cent. and not 50 per cent. should be external examiners. The credit system is really good and it might be adopted. We are going to recommend in the Calcutta University that credit system to the extent of 25 per cent. and not 50 per cent. should be started. I would like to wind up by saying that the examination system should not be abolished altogether and the written, oral and practical parts should continue as at present.

CHAPTER IX.

Selection of teachers, conditions of service and whole-time principal

Sub-Committee II which was assigned the task of examining these problems had before it a comprehensive note on the subject which is shown as appendix XIY to the Sub-Committee's report. In the note it was stated that there were at present four types of teachers concerned with the education of medical students in this country—(1) full-time teachers of non-clinical subjects such as Anatomy, Physiology, Pharmacology and Pathology including Bacteriology; (2) part-time teachers in subjects such as forensic medicine, preventive medicine, infectious diseases and mental diseases; (3) full-time non-practising teachers of clinical subjects; and (4) part-time teachers of clinical subjects. Of these, the teachers in the second category are usually *ex-officio* members of the teaching staff by virtue of their other appointments as Police Surgeons, Directors of Public Health or City Health Officers or Superintendents of Infectious Diseases Hospitals, etc.

The Sub-Committee pointed out that the duties of undergraduate and postgraduate teaching and guidance of research demanded much thought and careful planning. In most progressive universities there was a growing realisation that each department should consist of a nucleus of permanent staff and a contingent of short-term staff at all levels. The Sub-Committee recommended that, as a first step, the departments of medicine, surgery, obstetrics and gynaecology and anaesthesiology should be organised in this manner and suggested that, in the case of teachers and demonstrators, the proportion of full-time to short-time personnel should be of the order of 1 to 2. It was further suggested that full-time members of the departments of Pathology, Radiology, Biochemistry and Pharmacology should be included in full-time clinical departments. In accordance with these recommendations, it was visualised that, in every college, there would be well organised departments with a nucleus of full-time staff in medicine, surgery obstetrics & gynaecology and anaesthesiology, in addition to the full-time staff of the basic departments of anatomy, physiology, pharmacology and pathology.

With regard to the selection of teachers, the Sub-Committee felt that the present method of selection either by the Surgeon General himself or his equivalent or by the Public Service Commission, on which he or his equivalent or his nominee was represented as an expert member, did not appear to be suitable for making appointments

of a highly technical nature. It was suggested that, for selection to such posts, a committee on the lines of an electoral college, as in some foreign universities, or a board consisting of one member of the Public Service Commission with two or more eminent teachers in the subject for which the appointment was to be made, would probably constitute a more satisfactory selection machinery. The qualifications requiring careful assessments should be the ability of the candidate to convey knowledge, his postgraduate attainments and his capacity for carrying out or guiding original research. The Sub-Committee felt that it was important to see that the selecting authority enjoyed a large degree of flexibility in the manner and sequence of appointments. A suggestion was also made that automatic promotion from junior posts to that of a professor in the same institution should, as far as possible, be discouraged so that in-breeding of thoughts and ideas might be prevented.

Whether or not the teachers should enjoy a permanent tenure of service was discussed by the Sub-Committee and it was recommended that a system of five-year tenure, renewable on commendable performance, was worthy of careful consideration.

The Conference endorsed in general the suggestions put forward by Sub-Committee II, although the discussion on some points was inconclusive. The discussion covered a wide ground and some of the points that emerged out of it may be stated briefly as follows :—

On the subject of selection of teachers there was general agreement that the present methods were unsatisfactory and that the selection committee should be composed predominantly of experts on which, in the case of institutions run by governments, one member of the Public Service Commission might be represented ; in the case of non-governmental colleges, a committee consisting entirely of experts was suggested. It was stated that wherever a college was situated, the teachers should be the best that were available in the country, and that there should be no provincial barriers in selections. In this connection it was pointed out that some State Governments had not been forwarding applications from their employees for higher posts in other States, and that this practice should be discouraged. In the case of appointments to the posts of professors, it was pointed out that the Selection Committees should have the power to invite outstanding persons to take up professorial chairs without their having to apply for such posts.

The opinions expressed at the Conference regarding the qualifications of teachers were similar to those profounded by the Sub-Committee. It was agreed that, in addition to post-graduate qualifications, the ability to transmit ideas and the capacity for initiating and directing original research should form the main criteria of selection. A high premium was placed during the discussion on the research qualifications of the teacher and one member quoted in this connection Pirogoff's dictum that teaching without research

was no teaching and research without teaching was no research. Several delegates referred to the need for training the teachers in pedagogic theory and science. One delegate went to the extent of suggesting that teachers should be made to undergo a short course of elocution and public speaking. During the discussion on selection and qualification of teachers, references were made to the paucity of the right type of teachers. It was suggested that the authorities of medical colleges should pick out promising students, encourage them and even condition them in order to foster in them love for the art of teaching. It was suggested that there should be a clear-cut policy by which young persons of promise from the junior posts in the colleges were given facilities for higher training in the methods of teaching and research in foreign countries.

Although the Sub-Committee recommended a semi-permanent tenure of service for teachers, some delegates pointed out that teachers should not be kept in a state of insecurity and that a permanent cadre of teachers and research workers should be established on an All-India basis. It was stated in this connection that there was a great deal of discrepancy in the emoluments of teachers in different parts of the country and the recommendation was made that they should be made uniform. There was unanimity of opinion that the salaries offered to teachers should be attractive and it was pointed out that the Indian Medical Association had in fact recommended a salary scale for whole-time professors comparable to that given to the Director-General and Directors of Health Services.

There was considerable discussion on the whole-time principle. Some delegates were of opinion that all departments of the college should be manned by whole-time persons who were completely debarred from practice. It was, however, pointed out by one delegate that, as one of the main purposes of medical education was to produce private practitioners, there must be some teachers on the staff who are in private practice and are familiar with the home environment of patients. The general feeling was that, while the entire staff of the pre-clinical departments should be whole-time, there must be at least one unit in each of the clinical departments which was whole-time. It was pointed out by a delegate at this stage that it was not practicable in the present circumstances to insist that all teachers should be whole-time. He pointed out that several vacancies existed in the medical colleges in the country for want of trained personnel and he went to the extent of suggesting that it might be even necessary to appoint part-time teachers in the pre-clinical subjects too.

A question was raised as to whether the principals of medical colleges should be whole-time or part-time, and the discussion was inconclusive. Those who supported the part-time idea felt that, in order that the principals may come in contact with the students, it was necessary that they should have some teaching duties. It was further pointed out that teachers and students cooperated better with part-time principals than with full-time ones.

The conference then passed the following resolutions :—

SELECTION OF TEACHERS AND CONDITIONS OF SERVICE

1. that teachers in medical colleges maintained by Governments be selected by a committee, the membership of which should include a member of the Public Service Commission and at least two experts in the subject for which selection is being made ;
2. that for a non-governmental college, such selection should be made by a committee in which should be included as members at least two experts in the subject for which selection is made ;
3. that teachers should be paid adequately to attract and keep talent of a high order to man the medical colleges and that these teachers should be assured of security of tenure ; and
4. that all higher teaching posts should be filled by open competition, in which junior teachers in the college concerned should also be permitted to participate.

THE ESTABLISHMENT OF FULL-TIME UNITS IN EACH DEPARTMENT OF A MEDICAL COLLEGE

The Conference considers that, in order to bring about a definite improvement in teaching and to promote research at least one full-time unit should be provided in each department of a medical college, the members of which will be given satisfactory scales of emoluments and will be prohibited private practice of every form.

The teacher-student ratio

In order to implement the various recommendations made by the conference for improving medical education an essential step is to raise substantially the existing teacher-student ratio in the medical college. A satisfactory ratio to be aimed at will be, it is suggested, one teacher to five students.

Abstract of discussion

Selection of Teachers, Conditions of Service and Whole-time Principals

Dr. Ukil

I would like this Conference first to clarify the meaning of a teacher. There is a good deal of loose talk about the definition. According to some, even the laboratory technicians are teachers. So, it would be better if we first decide who would come under the definition of a teacher.

Dr. Viswanathan

Most of the Medical Colleges in India are under Government control. Since recruitment to Government gazetted posts is done by respective Public Service Commission, teachers in Government Medical Colleges are also selected by Public Service Commission. Commissions are composed of men selected for their integrity and impartiality. They are not expected to be swayed by any extraneous considerations. As, however, they are not experts in every field, they co-opt one or two specialists as advisers for a particular post. The advisers do not have the same privileges as the Members. Ordinarily the Commission Members use their own judgement based on assessment of the candidate's competence by the answers he gives at the time of the interview. I can well recall a Commission Member asking repeatedly candidate after candidate, what operation did Sir So & So undergo and for what purpose. Those who could not answer were not selected. This is bound to happen when non-technical people are asked to judge the capabilities and competence of candidates for technical posts. In my view, therefore, selection of teachers should be done by a committee of experts with a member of the Public Services Commission as Chairman. This is also the opinion of the Sub-Committee which went into this question. This is also the view of Dr. Khanolkar who has appended an excellent note on the subject to the report of Sub-Committee II.

What are the qualifications for a teacher? Postgraduate degrees and diplomas alone are not enough. A teacher should know how to transmit his ideas to the student in a clear and impressive manner. It will be a good thing if teachers in medical colleges are made to undergo a short course in teaching methods. A teacher in medicine should be source of inspiration to the students. This he can be only if he has some original work to his credit. Teaching and research should go side by side.

In my opinion, every major teaching department in a medical college should be staffed from Professor down to Demonstrator or Registrar both in pre-clinical and clinical departments, by whole-time men or women as the case may be, who should be completely debarred from private practice of any kind. Otherwise, they will not be able to devote sufficient time to teaching and research. Though they may be able to teach, they will not be able to do any research.

The question whether teachers should be employed on a contract basis or should be given permanent service and security of tenure has been discussed at length during the meetings of the Sub-Committees. It has been argued that if a teacher is employed on contract, he will work with vigour and energy for its renewal. Otherwise, he will continue sitting pretty on his past laurels and is likely to stagnate. Though it may be true in certain cases, I am not in favour of keeping teachers in a state of insecurity. We are talking today and rightly about Central Cadre for teachers and research

workers. There is everything to commend the creation of such separate and permanent cadres both for teachers as well as research workers. I wish to point out, however, that promotion should be based entirely on merit and seniority should not be a basis for promotion. I am also in favour of Readers and Professors' posts being filled by open recruitment and not by promotion from the junior staff. This will partly prevent possibility of inbreeding slip.

Dr. de Quadros

Since this Conference is concerned with principles I would like to define teachers as those who teach themselves first before even thinking of teaching others. Hence radiographers and technicians, though there may be academic and administrative objections, can be teachers. We can learn from them.

There is no place comparable to a medical school for the correct assessment of values and no psychoanalysis more penetrating than that of the unformulated judgement of several generations of students. How many of us, let us be honest, had to concentrate on the " tricks " of examiners and were left to learn by ourselves ? Perhaps it was a good thing. Let us do a little introspection on ourselves.

One looks around these days for teachers who by *personal example* show insight, method, enthusiasm and powers of observation ; for teachers who are ever unhappy with their efforts and critical of themselves.

We are discussing selection of teachers. Where are the teachers to select from ? What is wrong ? Why do we not get teachers ? I do not subscribe to the view that inadequate salaries is the only hinderance. Are we in authority picking out students likely to make teachers, encouraging them ; tuitioning and even conditioning them to foster a love for the art of a teacher ? Some more effort on our part is necessary to convince some of our students that there is a glamour in teaching just as there is glamour in private practice and in the shining cadillac of a prosperous consultant. Perhaps our own example has not been sufficiently stimulating. It is food for thought.

If the Public Service Commission is to select our teachers, I suggest we recommend that our experts on that Commission when co-opted are not to pictures decorating a wall but should have the right to vote.

Having selected a teacher let him be subjected to an Elocution Test. Perhaps it would do us all good to attend a recognised course in elocution and public speaking occasionally. Let us select our teachers with the same care as any nation worth its salt selects its army and navy personnel. Let us then be proud of these men and women who will be expected not only to instruct but also to inspire.

In their conditions of service, care should be taken to see that they have been paid well and kept reasonably contented. Let them

go abroad as often as possible. Such visits tend to level down the complacent, the arrogant, the staunch upholder of tradition and the stubborn defender to the *status quo*. It has amused me to hear in this room " I have been 20 or 30 years doing this or that. " Let me merely say that it has not as yet been biologically proved that ability keeps pace with somatic growth. In fact it often sags along with our waist line.

On promotion I plead not to equate security in a service with sedatives and hypnotics ; equate it with convulsants and keep the teacher on tip toe. Good work should be recognised and rewarded. The work of a teacher should be assessed by a Board of Assessors appointed by the Government or later on by the Association of the Medical Colleges when that comes about.

I finally recommend for your serious consideration the scholarly note on this subject by Dr. Khanolkar and the report of Sub-Committee II of which I had the honour of being a member.

Dr. K. L. Wig

I am in general agreement with Dr. Viswanathan as regards the methods of selection of teachers. It is very advisable that experts should have a greater say in the matter of such selections than they have at present.

Dr. Viswanathan has advocated full-time teachers in all subjects. While I agree that there should be full-time teachers in non-clinical subjects, I do not agree that that should be so in respect of all teachers of clinical subjects. Whole-time teachers have no doubt certain advantages, especially as regards carrying out research. If, however, you have to produce general practitioners and prepare the students properly for that, you must have teachers who have indulged in private practice themselves and are familiar with how to deal with patients in their homes. Thus, as recommended by the Medical Council of India, while one unit in clinical subjects may consist of full-time teachers, there must be others on part-time basis, who should be in private practice in the clinical subjects.

As regards Principals of Medical colleges, it has been said that they should be full-time employees. Conditions and needs differ in different colleges. However, it is often found that whole-time Principals cannot get that much cooperation and respect from the staff and students as teachers acting as part-time Principals. If due to some reasons some institutions feel that necessity of a whole-time Principal, then such Principals should be men who have been teachers in the recent past.

Dr. B. Narayana

The selection of teachers is a very great problem particularly when we deal with colleges of different types. There are medical colleges

in India with control from different authorities. There are 27 colleges under the control of State Governments, 2 under the Universities and 9 managed by Municipal Corporations, Missionary Societies and Private Enterprise. At present recruitment of teachers in Government colleges is done by Public Service Commission assisted by experts but there are colleges where appointment to the posts of teachers including professors is a routine posting from amongst the Officers of the State Medical Service. I do not know how far this method is healthy. Perhaps a good idea will be to have a Committee of Experts along with one or more members of the Public Service Commission in the case of Government colleges and in the case of private colleges this work should be done entirely by a Committee of Experts.

In the selection of teachers there should be no provincial barriers. We must have the best teachers because the students want instruction by good teachers and not by teachers from a particular State. To ensure that good teachers are made available, the tenure of appointment should be permanent ; attractive salary should be provided and suitable residential accommodation should be made available. However, mere paper qualifications are not enough ; the work done by way of research should also be taken into account. A good teacher will encourage the student to do research and may himself undertake research. Even if some deviation from the suggestions made above are permitted for junior appointments, the senior appointments like those of Professors, Readers and Assistant Professors should invariably be made with the advice of Expert Committee.

Dr. Rakshit

There is at present a great dearth of persons taking to teaching profession. Present day Professors in medical colleges are making only very nominal contributions to research. Most of their time is employed for the routine duties of teaching and in the administrative work. Unless there are a number of able assistants, the Professors will not be in a position to direct their energies to research work. In my opinion a member of the Public Service Commission should be associated with a Committee of Experts in selecting teachers and this should apply not only to Government Institutions but also to private ones. In order to attract men to teaching profession it is necessary to give them adequate pay, amenities and security of service. All facilities should be provided for the junior teacher to complete for professor's post either in the same college or in other colleges provided they show proficiency. At present some State Governments do not forward applications from Lecturers for appointment as Professors in other institutions. This is unfair and this Conference should try to remedy this handicap. Lecturers who cannot be promoted to professors' posts should continue to draw the pay of their grade and be granted additional pay when they reach the minimum of the grade.

If this is not done they will remain discontented. In my opinion the Principal of a medical college should be a full time Officer and should not be burdened with teaching work. With regard to full time and part time teachers, I feel that in non-clinical departments all teachers should be full time and non-practising while in the clinical section at least one unit should be full time and non-practising.

Lt.-Col. Amir Chand

In certain places the criteria for selection of teachers may be summarised by three S's : Senility, Seniority, and Servility.

In selecting medical teachers seniority alone should not be the determining factor but teaching ability in addition to academic qualifications and experience must count also. Seniors should hear their juniors teach so as to get first hand knowledge of their teaching capacity and not be satisfied with what at least is a second hand report that so and so is a good teacher. The voice of such seniors should count more in making appointments than that of outside selectors who do not have first hand knowledge of the teaching capacity of the candidates and with whom the ability to teach may not count much.

This brings us to the question of formal teacher training. It is an anomaly that while school teachers, even those who have to teach the three R's to quite young children, are given training in the art of teaching, medical teachers do not receive it. A 5th year medical student, writing on medical curriculum, has recently said that no one should become a teacher until he has had adequate training in the methods of instruction. It is understood that provision for teacher-training will be made in the All-India Institute of Medical Sciences but one Centre alone in the country will not suffice. Such provision should be made in as many of the medical colleges in the country as possible.

As regards full time Principals of medical colleges, it is highly desirable that the Principal should do a certain amount of teaching because that is the only way in which he can come in intimate contact with the students which is so vital for the maintenance of teacher-student relationship. The system of appointing non-teaching Principals is not to be recommended.

Lt.-Col. Sangham Lal

Like many other recommendations of the Sub-Committee II this one is also based on ideology and not on practicability. I am glad that Dr. Yodh has expressed in so many words that we are concerned with laying down ideals. People like me who will have to implement these recommendations have to try to be realistic.

It has been suggested that in Government institutions senility and seniority alone have been the criteria for the selection of teachers. I may be permitted to say that Madras has supplied most of their

retired teachers to the new medical colleges and they have not been considered to be too senile for those appointments.

The Vice-Chancellor of Patna University, Dr. B. Narayana, has mentioned that Directors of State Medical Services appoint teachers without due regard to their capabilities as teachers. In Madras these appointments are made with the approval of the University and the University is very jealous of its standards. It is laid down that 4 years of work in a teaching unit after post-graduate qualifications should be the criterion for selecting teachers. In my opinion the recommendation that professorships should be tenure appointments is not desirable since it adds the danger of insecurity to the worries of a professor.

It has been laid down that research should be one of the conditions for renewal of professorships. The conditions in institutions are to-day not conducive for research work on account of lack of equipment, lack of assistance and facilities.

The promotion of assistants to professorships in the same institution, it is stated, should not be encouraged. This also is not practical under our conditions. The answer to the problem is well paid teachers, adequate number of well paid assistants and adequate equipment.

Dr. M. L. Chakravarty

In order to convey a medical bias in the teaching of various subjects in the medical curriculum it is necessary to appoint on the staff of the colleges only those who possess a basic medical degree.

Dr. Carman

Old age is not necessarily senility. In our private institution in Vellore we have been glad to have the help of some teachers after their retirement from Government service. However, we must constantly focus our attention of finding, training and selecting younger persons. I think we must have a resolution which will suit all medical colleges both Government and private and I suggest we emphasise in it that there should be a Teachers Selection Committee and that on such a Committee, Experts representing the subjects should be appointed.

Dr. Sen

I have no objection to one unit of a department being manned by whole time teachers. However, I have just heard that while we want more teachers, a number of posts in medical colleges are still vacant and cannot be filled. This seems to me rather an anomalous position. Dr. Wig has pleaded for part time teachers in clinical subjects. I would go further and suggest that part time teachers be appointed even in non-clinical subjects. This programme I would suggest not only for Government colleges but for private institutions as well. With

regard to salaries of whole time teachers, I agree they are too low. It will come to you as a surprise that Indian Medical Association had recommended a salary scale of whole time professors comparable to that given to the Director General and Directors of Health Services, I do not see any reason why those who are considered eminently suitable to hold posts of whole time professors should be considered in any way inferior to administrators. In foreign countries professors are in many cases part time. They have risen to these eminent positions by judicially spending their time at hospital work, their practice and their teaching. In this connection the experience of the University of Chicago Hospital is very interesting. The Faculty consists of over 300 people including internees, residents and other who are all full time. They are able to maintain this institution with income from endowments which is 10 per cent., grants from liberal sources 30 per cent. and income derived from patients 60 per cent. It is under these conditions that a hospital of that type is being run.

With regard to the selection of professors some change is necessary. All candidates need not apply but they should be invited by the Selection Committee for the appointments. In this connection I would refer to the practices in some European countries particularly in Germany, Finland and Austria. There the Selection Committee consisted of men not from their respective regions but from outside. This ensures appointment being made on merit and not by influence or otherwise.

Dr. Kutumbiah

I would like to say a few words with regard to private colleges. Much of the discussion that has taken place pre-supposes that there are plenty of applicants for a post of professorship and it is only a matter of selection from the available material. But if you look into the records of many of these colleges you will find that there were no applicants for this post and they had to go in search for applications. There is no machinery whatever to operate in medical colleges by means of which one can get a suitable stream of qualified people to hold such posts. I would like to suggest that there should be a policy by means of which the candidates will be selected and sent abroad on study leave. We might get a regular supply of trained persons from which to make the selection. As regards suggestion about Selection Committees, the recommendations are not feasible in respect of private colleges as you cannot invite the Public Service Commission to come and sit down for instance at the Vellore Medical College and select the candidates. Selections have to be made with the prior approval of the University which has laid down specific qualifications for the post.

Dr. Alan Gregg

I think there are three points we can think of in connection with the selection of professors : (i) wide selection to have a real choice ;

(ii) higher salaries which will make the choice wider ; and (iii) full time facilities. The Scandinavian countries specify the following criteria :—

(a) Has the candidate added to the knowledge in his field by a substantial degree ;

(b) Can the candidate lecture comfortably and prove it to the satisfaction of the Faculty to which he is a candidate ; and

(c) Other qualifications.

The system of choice should be such as to favour the right standards and motives of competent young men.

Dr. Gujral

I want to make two points. The first is that I do not subscribe to part time teachers because every teacher wants to go to the clinical subjects and the basic subjects will be starved. In my opinion the teacher should be full time and they should be well paid. The second point is that salaries in different parts of the country are very disproportionate. If, therefore, we want to attract teachers to all parts of the country we must propose a uniform scale of salary for all States.

Dr. Ukil

I would like to make a few points. Firstly, the non-clinical departments are often asked to do routine work of the hospital as is the case for example in Bengal. I would like the Conference to express an opinion whether this is desirable or not. The second point is with regard to research experience. It is well to remember Pirogoff's dictum " Teaching without research is no teaching ". There should be exchange of ideas between professors of medical colleges and they should have the facilities to travel round to various Faculties in the Medical Colleges in the country. Foreign visits are also good. I would like to mention that many doctors are being trained abroad as arranged by the Indian Medical Association. We should take a stock of these workers and utilise them for our teaching departments.

As regards research I would like to emphasise that there should be better coordination between the activities of the Indian Council of Medical Research and other research organisations under other Ministries, namely, Council of Scientific and Industrial Research and Indian Council of Agricultural Research. I would also like the Conference to give a clear indication as to the minimum teacher-student ratio in the medical colleges. We should discourage the prevalent practice in Government service of transferring Officers from teaching to non-teaching posts and *vice-versa,* and this Conference should urge the Governments to select suitable persons for teaching cadres which should be maintained separate from other cadres.

CHAPTER X
Electives

Sub-Committee II had given considerable thought to the question of providing elective time for the medical student during his undergraduate curriculum. In the curriculum suggested by the Committee the student was expected to get an integrated concept of the most important principles of medical science. It was considered desirable, however, that he should also be given opportunities to develop his ability to reason critically and learn to apply his mind to the logical solution of problems which would confront him throughout his professional career. Such opportunities, if designed with care, would help a student to develop initiative, discrimination, maturity of judgment and a sense of responsibility.

In order to achieve these purposes the Committee indicated seven fields of elective studies which could be utilised by the student in working on subjects of his own choice. These are found in the appendix to the Committee's report. The Sub-Committee also indicated the nature of elective studies provided for students in certain universities in the United States. The Sub-Committee recommended that 25 per cent. of the student's time should be devoted to elective studies and made provision for this in the curriculum they suggested.

The recommendation of the Sub-Committee received acceptance from the Conference with almost complete unanimity. It was pointed out during the discussion that elective time would help to shift the emphasis from teaching to active learning by the student himself. The need was stressed to ensure that the programme, if it was to be successful, should be really elective, *i.e.*, the student must make his own choice of the subject he wishes to study, should be free from the formal restraints of a classroom atmosphere, and should, at the same time, receive the help and sympathetic guidance of a trained teacher. One of the speakers put forward a useful suggestion in this connection. Medical education is expensive and is not always within the means of an average Indian. With the provision of free time there is the possibility of developing a ' give and take ' scheme between the college and the students, whereby part-time employment may be offered to them, especially to those who show aptitude for research and can, therefore, be admitted for participation in the research programmes of the institution.

While, as already pointed out, the suggestion for the inclusion of elective courses was accepted practically unanimously by the Conference, the recommendation was made that the Sub-Committee's proposed allotment of 25 per cent. of the total curriculum hours to such courses might be reduced to 15 per cent.

The Conference did not adopt any formal resolution on the subject.

Abstract of discussion
Electives

Dr. S. K. Menon

I have been associated with the work of Sub-Committee II and I participated in the joint deliberations that took place on 19th and 20th September. Whenever we took up a problem for study, we have always asked ourselves these following four questions :—

1. What is our aim ?
2. Is our present educational pattern best suited to achieve this aim ?
3. If not, what shall we suggest to improve it ?
4. Are our recommendations practical and possible of implementation ?

If I am asked to mention one of the most important aims of undergraduate medical education, I would have no hesitation to say that it is to establish habits of reasoned and critical judgement of evidence and experience and to develop an ability to use this experience and judgement wisely in solving problems of health and disease. Medical education is a life-long process and the medical graduate who leaves his training centre must be provided with incentive for active learning by himself as he has to continue to learn all his life.

Does our present educational pattern achieve this aim—Definitely not to the desired extent. What shall we do to shift the emphasis from teaching to active learning by the student himself ? Active learning involves considerable thinking and demands time when the student is left to himself. To achieve this objective, we have in our recommendations laid special stress on teaching methods. The incorporation of elective time and elective study in the regular curriculum is another attempt to achieve this object. Almost all of us have not had the benefit of elective studies during our medical training.

The present curriculum is already very much overcrowded. The rapid strides that Medical Science is making and the enthusiasm of professors who are specialists are tending to make it grow larger by accretions. The unfortunate medical student has no time to think and to apply his mind to the active process of learning by intelligent observation, sound reasoning and logical deductions. In elective hours he is given an opportunity to do this. To be successful, it has to be really elective, that is that the student should make his own choice and he should work under guidance. He should be given an opportunity to develop his own individuality in respect of the subject of his study. I may say that unless there is guidance, there will not be much success in the early stages. Later on, it becomes increasingly easy for the student to do it quite well with very little assistance. We should aim at making it his second nature by the time he leaves the medical school.

How much time should be set apart for this and what should be the subjects and channels of elective study have been given in a special annexure to our recommendations. Dr. Wahi will speak about it. I admit it is difficult. We will need more staff and more money. It is very difficult to be really good, but that should not deter us from teaching young men to go along the path of rectitude.

Dr. P. N. Wahi

This Conference is considering the reorientation of our educational concepts and introduction of newer methods of teaching so that the time spent by a student in a medical college is better utilised and results in a more useful doctor than at present.

The provision of " elective time " in the curriculum of a medical student, which is really the time spent by student on self-education, is designed to achieve the above aim. The student is encouraged to vary his course of study according to his special interest and particular talents, as far as is consistent with the requirements stipulated by the universities, Medical Council, etc.

The programme of medical education should be so formulated that it takes into consideration not only the problem of how to produce a doctor but also the responsibility of producing one who will continue to contribute to medicine and who will be actively interested in the progress of medical research. In other words, his intellectual equipment should be such that he can approach all later problems in the manner of a scientist and research worker imbued with the spirit of critical evaluation. This involves considerable independence, habit of logical thinking, sense of responsibility and initiative, besides a sound knowledge of the subject matter involved.

Perhaps, this is placing too high a demand on the average medical student but some move can be made in the proposed direction, if certain aspects of the present educational programme could be rearranged. This could be achieved by providing the student with " free time " during the academic week which he could devote to his particular interest under the supervision of trained personnel. His particular interest and abilities might receive impetus where he will be free of a formal restraining class-room atmosphere. He would get a change to experiment with his own abilities and find out his failings.

The medical student, after the termination of his studies, is not a finished product but at the most a " potential doctor in an amorphous state ". It is after graduation that he tends to crystallise into specialised practice. Let this crystallisation be according to his aptitude rather than the result of a particular type of demand. If you agree to this principle, we should provide opportunities to him during his education to determine his aptitude by providing with elective training. He will have time to use the library, work in some particular laboratory, or even the neighbouring science college. If he feels he is deficient in some area essential to his work he will try to improve this by extra study and attendance at lectures for which he is not formally enrolled.

An important aspect of this programme is that the student should be made to feel that initiative for such activity has come from himself and he is free from adult authority and has time for himself. The students would consult informally the members of the staff in regard to the use of their time for elective work. It is not advisable to establish a formal advisory system.

At present medical education is mostly academic even though there is time allotted for practical work. Even the practical training provided is more theoretical than practical. During the " Free time " the student can acquaint himself with laboratory techniques and carry on associate research.

There is another obvious advantage of this elective training programme, namely, increasing the research potential of the country. We all know that at present the demand for research worker far exceeds the supply. There are undoubtedly many factors that contribute to this situation, but to my mind the most important is the absence of effective research programme for medical students, which would emphasise the important role of critical reasoning and evaluation in the study of disease and management of patients. These are the gifts of training in research. As a part of the elective training programme the medical student can be provided with opportunities to perform experiments as part of their curriculum, in order to emphasise the dynamic concept of disease. The student will thus get the opportunity to test his apitude and some with a strong positive bias are definitely likely to choose research as career.

There is still another facet to this question. We all realise that medical education is very expensive and is beyond the means of an average Indian and has to be subsidised by the Government. However, with the provision of free time, there is the possibility of ' give and take ' programme between the college and students. This would mean part time employment of students especially those who may represent future potential research workers or teachers in the particular subject, for incidental research jobs and initiating new research projects to a point when other support is justified. Such ' Career investigation grants ' will help the students to partly pay for their education. It is desirable that the present day student should get time to brouse around on their own, to read magazines and journals, to meet patients informally. This would help them form their own ideas and opinions of what they are learning. This would inculcate in them a desire for balanced curriculum, train them to be doctors for a vocation, yet producing a love for learning and knowledge so that they remain for ever students and researchers.

The present medical curriculum of set lectures, demonstrations. etc. without giving any opportunity to the student to discover himself results in an unrealistic concepts of motivation. The learning process

of a student is to a considerable degree affected by motivation. I may be permitted to quote Rusell Meyer that " in fashioning technics for teaching and learning consider motivation on a parity with intellectual capacity, physical health, emotional stability, socio-economic status, previous educational back-ground and habits of work ". I would illustrate by an example I read of a medical student who was peering through a microscope examining pathologic tissue, when an instructor posed a few routine questions. The student, unable to furnish satisfactory answers, arose and demanded to know what 'good' could be expected to accrue to him from all this detailed microscopic study. His intention was to become psychiatrist. Would you censure the student ? The fact that such a question can exist at all in the mind of the student is clearly indicative that it deserves consideration in its own right.

I would end by commending to this conference to accept the recommendations of the Sub-Committee II to provide ' elective training ' a definite place in the medical curriculum to the extent of 15-17 per cent. of the time. The acceptance of this recommendation does not interfere with the teaching of regular subjects, as can be seen from the suggested time-table.

Dr. K. C. K. E. Raja

I wish to draw the attention of the members to a particular programme of work which I saw in the Medical College of London University 2½ years ago. I was informed that in this college group discussions are organised to stimulate initiative and powers of observation of young entrants to the medical course. A few lectures are given on how to observe things and after that group discussions are organised. During the discussion members present their ideas which would form the basis for discussion. This method resulted in stimulating powers of observation in medical students and in promoting interest in research.

CHAPTER XI

Association of Medical Colleges of India.

Sub-Committee II in forwarding their recommendations on the various aspects of medical education referred to them had observed that further progress in medical education would be possible if medical educationists organised themselves into an association on an all-India basis and met on a common platform to discuss their problems. This view was endorsed at the joint meeting of the three Sub-Committees which had met to consider all the related documents which were to be submitted to the conference. It was generally felt that there was need for consultation on a wide basis in regard to different matters relating to medical education. It was suggested that provision should be made for calling together in conference from time to time medical educationists and others interested in the subject.

In pursuance of these recommendations a note was circulated to the Conference suggesting :—

(i) the creation of a permanent Council of Medical Education which should cover, within its range of functions, the various aspects of medical education including the organization of studies, the financing of such studies, the assessment of their results and the formulation of suitable recommendations to the educational authorities of the country ; and

(ii) formation of an Association of Indian Medical Colleges which would provide a forum to all educationists in the country to discuss the problems of medical education and review from time to time the progress made in different aspects of medical education.

The Conference did not take into consideration the first item referred to above but dealt only with the second relating to the formation of an Association of Medical Colleges of India. It became apparent during the discussion that, on this subject, there was a sharp difference of opinion. The view was expressed by a number of speakers that no useful purpose would be served by establishing an Association on the lines that have been suggested as it might interfere with the legitimate functions of the Medical Council of India which had been doing useful work in the whole field of medical education since its establishment 23 years ago. According to these speakers all that was needed was to modify the present composition of the Indian Medical Council if it was considered that such a modification was necessary. The creation of a new organisation it was stated, would only result in a duplication of effort. It was also pointed out that the

ultimate responsibility for medical education rested on the universities and that it was inadvisable and unnecessary to override their powers by creating another organisation to deal with the subject. One speaker suggested that since the delegates did not have an opportunity to discuss this subject with their colleagues as in the case of other subjects, consideration of this proposal should be postponed.

Those who favoured the formation of an Association of the kind that had been suggested pointed out that such a body of educationists would indeed strengthen the hands of the Medical Council of India and not really interfere with its function. It was also pointed out that, during the discussion of several aspects of medical education in the Conference the need for experimental studies of the problems of medical education was brought out. As these experiments progress there will be the need to report on the experiences gained and to discuss the results. An organisation of teachers would really provide the most suitable forum for such discussions.

The view that emerged from the discussion was that the initiative for the establishment of the proposed Association of Medical Colleges could come more appropriately from teachers themselves than from this Conference, which had been convened by the Government of India. Such an organisation, if created by the teachers, would find general acceptance like other associations of specialists already in existence in the country. In the circumstances no formal resolution on the subject was adopted.

Abstract of discussion

Association of Medical Colleges of India

Dr. Raja

In the memorandum which I had submitted to the Conference I had drawn attention to the suggestion which was put forward at the joint meeting of the three Sub-Committees, namely, that there was need for consultation, on a wide basis, in regard to different matters relating to medical education. It was suggested that provision should be made for calling together a Conference, from time to time, of medical educationists and others interested in the subject. In pursuance of that suggestion, I feel it would be desirable to establish an Association of Indian Medical Colleges, membership of which could be extended to teachers in medical colleges as well as to some others who might be interested in medical education. It is desirable that various matters relating to the teaching of medicine should be discussed and resolutions formulated on the basis of agreement as far as possible. I would request the Conference to consider this question seriously.

Dr. Ukil

Dr. Raja has suggested that an association on the lines of the American Medical Colleges Association should be started in this

country. Is this the only suggestion or is there any other ? In the memorandum he has suggested that a permanent statutory Council on Medical Education should be created by the Government. I am opposed to that idea, unless we know the views of Medical Council of India, the universities and other bodies concerned. It is, however, for this Conference to give its opinion on the creation of an Association of Medical Colleges if such an Association was desired by the different medical colleges in the country.

Lt.-Col. C. K. Lakshmanan

I think Dr. Raja did not suggest the creation of a rival body which will generally control medical education in India.. All that he has suggested is that there should be an Association of Medical Colleges and Research Institutions which would meet at intervals and discuss and make recommendations.

Dr. C. S. Patel

I wish to make some observations on Dr. Raja's suggestion. If these suggestions are accepted it would create a great deal of interference in the working of the Indian Medical Council. We should not copy or imitate the educational methods of other countries like U. K., America, etc. It is always advisable to evolve our own pattern in these matters to suit the needs of our country. It is no use forming an Association of Medical Colleges in India like the American Medical Colleges Association as the Indian Medical Council is doing most useful work in the field of medical education for the last 23 years. It has not only laid down the standards of education but it has also raised those standards and it has taken adequate steps from time to time like revision of curricula, qualification of teachers, rules regarding examinations and examiners and also the standard requirements of a college and admission of students annually. The present Council is a body comprising representatives of universities professors and teachers of medical colleges and Government nominees. I shall be happy if the present composition is modified in such a manner that the principals of medical colleges are nominated on it by State Governments and Central Government and there are representatives from specialist associations. This would give enough representation of all types of medical educationists. I am against creation of new Councils and new Organizations to deal with the different aspects of medical education. What is necessary is to enlarge the present Council so that representatives of various educational bodies are adequately represented. Dr. Raja's suggestion may look pious but I am afraid the danger remains that after some time such a resolution would be made use of as creating bodies, statutory and non-statutory, and thus duplicating the work of the existing controlling organisations. It is for this reason I would appeal to the Conference not to entertain such a suggestion. I am happy to feel that this Conference has done useful work and when their recommendations are sent to us I assure you I

shall try my best to give effect to them through the cooperation of the Universities and Medical Colleges. You know my Council is trying its best to effect changes in curriculum, etc. in view of the advances made in medicine. I, therefore, trust that the members present here would oppose this suggestion made by Dr. Raja.

Dr. Chandy

I do not wish to raise any controversial points at all. The Medical Council of India is certainly doing very good work. No body is going to question that. In this Conference we have discussed a number of questions. It is very essential that we should have an organ or a Journal of our own to express our views. Who is going to sponsor it ? We may not be able to meet again as a body together. So, for the purpose of intercommunication there should be a body like the Association of Medical Colleges. It does not matter whether it is a separate body or under the Medical Council of India.

Dr. Raja

I regret Dr. Patel has based his remarks on a misunderstanding of the situation. In my memorandum I had discussed the procedure followed in America. In that country matters relating to medical education receive consideration on a wide basis through discussions by committees of experts and later by the Association of American Medical Colleges. The stimulus for promoting improvements in medical education comes, in that country, from those who are competent to consider what these improvements should be, namely, the teachers, the medical profession and medical administrators, who all take part in such committees and conferences. It is open to the medical colleges of the country to accept or not to accept the recommedations that are put forward. There is no element of compulsion as would be the case if statutory bodies functioned in the field of regulation of medical education. In the memorandum I also referred to the functions performed by two statutory organisations, namely, the Medical Council of India and the Medical Council of Great Britain. It seems to me that a combination of the two methods of approach, namely, our own with its emphasis on certain statutory powers and the American method of stimulating progress through provision for consultation and discussion on a wide basis, would lead to happy results. I do not think it is right to say that this proposal for the creation of an Association of Indian Medical Colleges would result in cutting across the rights and responsibilities of either the Medical Council of India or of the universities in the country. With such opportunities for the discussion of different medical education problems as the proposed Association will provide, universities and the Medical Council of India will find their labour lightened and the formulation of common programmes of action to improve medical teaching over the country as a whole will be facilitated. The convening of the present conference is, to my mind, in itself an indication of the need for

consultation and discussion on a broad basis. It will contribute much to future progress if the Conference can lay down the steps to be taken to promote periodical discussions of the problems of medical education. The establishment of the proposed Association is one of the methods of achieving this end. (Dr. Raja then read out passages from pages 10 and 11 of his memorandum.)

Lt.-Col. Sangham Lal

Dr. Raja has read the sentence pointing out to the desirability of planning medical studies on a broader basis. I do not understand what this broader basis is. Our universities are responsible for education. How can you override their powers?

Dr. Trivedi

We have got several Associations ; every branch of medicine has an Association, such as, Association of Physicians, Surgeons, etc. We have been discussing in this conference a number of subjects, development of museums, exchange of materials and so on, and we are talking about exchange of ideas between men and men and between one institution and another. The Indian Medical Council exists to-day as a statutory body. My idea is that the more we meet, the better we would then be able to crystallise our ideas for the help of the Statutory Bodies.

Dr. Karunakaran

The Indian Medical Council is a Statutory Body. Let us see how the recommendations of this Conference are going to be viewed and implemented by the universities and the Indian Medical Council. After reviewing the whole position the proposition can be taken up again without creating any misgivings in the minds of the universities and the Indian Medical Council. I submit that the consideration of this may be deferred to a later date and a topic of controversial nature is not brought up and decided at the very first conference itself.

Dr. Subodh Mitra

As a university man, I feel that the universities are losing their prestige of working as autonomous bodies. The universities are already under the control of the Indian Medical Council. Recommendations made in this conference could have been long ago implemented had there been sufficient funds at their disposal.

Under the circumstances, I would recommend to have this Medical Education Conference deliberations once a year and not to create another Association of Medical Colleges which is supposed to have no authority nor any statutory power. It appears to me to be redundant.

Lt.-Col. C. K. Lakshmanan (Chairman)

We have met here on so many days and had so many discussions without any fear or favours. They are made with open minds to consider how best the undergraduate teaching could be improved upon in the light of experience abroad and how we can plan out certain experiments in many fields of medical education. We have accepted that medical education should be considered just as any other field for experimental research. If we are going to secure funds to promote such experiments and to implement them it will be necessary not only to have the experiments carried out but also to assess the results. It is for this that an organisation consisting of medical teachers and educationists has been suggested without there being any officials who are bound by rules and regulations. The Association of Medical Colleges which is suggested is not going to be a Statutory Body but is going to be an academic body only to improve medical education in India.

Dr. Banerjee

The Medical Council of India which was established by an Act of 1933 has been regulating undergraduate medical education. The establishment of another Body entrusted with the same functions will only create confusion.

Dr. B. B. Yodh

I think the time has come to strengthen the hands of the Indian Medical Council by collecting different opinion regarding our problems of medical education. A statutory body will not have much chance of achieving our objectives as well as an independent body composed of educationists themselves. I have, therefore, moved a resolution as follows : " In order to further the interest of medical education in India this Conference recommends that an Association of Medical Educationist be formed in India to discuss problems in medical education and to review the progress made in medical education from time to time". I can assure you there is nothing behind this resolution and it is a perfectly harmless one.

Dr. Vengsarkar

We have taken certain decisions at this conference with an idea to achieve the aim and objects of medical education to suit the needs of India. We have laid down fundamental principles in this respect. We have agreed that education should be treated as a subject for experimental research. We have also recommended that schools should be allowed to evolve their own methods for selection of candidates for admission, to try experiments on integrated methods in teaching, introduce electives and free time for students for their self-education and to adopt suitable measures of assessing the students' progress continuously throughout the entire course of their training

period. As these experiments will be undertaken at some of the schools the teachers concerned would feel the necessity of reporting their achievements. A journal of medical education will be the instrument suitable for this purpose. We have decided earlier to meet at a conference to discuss some of these reports and evaluate them so that after critical study all of us can benefit and implement improvements in medical education. Such conference will have to be organised by a suitable body of ourselves and this body should arrange for publication of the Medical Education Journal. If we organise ourselves we will be able to take right and progressive steps in raising the standard of education to the best interests of students, medical schools and nation. We may also be able to lead or show some ways of improvements in medical education and thus establish reputation for our nation in the map of world of medical education.

I therefore suggest that this Conference should agree to the recommendation of organisation of an Association of Medical Colleges of India with its own organ for expression of the activities of its members.

Dr. Sarkar

Dr. Yodh has stated that it is necessary to further the interests of medical education. Didn't we discuss this for the last three days? Obviously, there will be necessity for further discussion. We have come to this Conference with the opinions and views of our colleagues in the institutions where we worked and the administrations under which we worked. If we pass this resolution now, I feel that we shall not be loyal to the people whose interests we are here to represent. We have agreed to carry on certain experiments on the resolutions and ideas which have been expressed here and there will be the need to consult each other about the results of our experiments. Will that object be served by yet another association? There have been so many associations and I feel that many of them were either short-lived or did not do any active work. I therefore feel that the idea of forming an association should not be taken up at this stage.

Lt.-Col. Sangham Lal

It appears to me that an innocent looking resolution proposed by Dr. Yodh on the foundation of an Association of Medical Teachers has evoked a sharp reaction from the President of the Indian Medical Council and some university representatives. If the intention is as stated of forming an association of teachers like similar associations of surgeons, physicians, etc., with no special privilege or patronage, there can be no objection. I am sure that such an association will be welcome to all the teachers and those interested in medical education. I feel, however, that such an association should be started and organised by teachers themselves and not by this conference. This conference should have nothing to do with specialist associations and as such this conference need not pass any resolution on this subject.

Dr. Nigam

I wholeheartedly support what Colonel Sangham Lal has stated. I feel the formation of such associations should come from the institutions themselves. This conference is not the Body to recommend the formation of an association. Let this suggestion be forwarded to the various faculties and their comments obtained. It would be better to leave to the Faculties themselves to form an association of this sort. If the suggestions come from medical colleges themselves, I would wholeheartedly accept the recommendations of Dr. Yodh.

Dr. Patel

Regarding the resolution put forward by Dr. Yodh, I wish to state that it is not necessary for this conference to adopt it as is convened by the Government of India. Associations of any type may be formed by the professors, independent of government like other specialist associations already in existence in the country such as the Association of Anatomists, Physiologists, Pathologists, etc. I should be very happy if such an association of medical educationists is formed by the profession to which no one can raise objections. This conference should not take up this question. I hope my colleagues will agree with my viewpoints.

CHAPTER XII

Concluding Session

The Conference met in plenary session on the morning of 22nd November 1955 with Lt.-Colonel C. K. Lakshmanan in the chair. The Chairman at the outset invited the distinguished visitors from abroad, who participated in the conference, to let the conference have the benefit of their views on the various subjects discussed during the past three days. The observers from the World Health Organisation, the Rockefeller Foundation, and from Burma, Ceylon, Indonesia, Thailand and China then addressed the conference. They expressed their satisfaction over the achievements of the conference and conveyed their thanks to the Government of India for having convened the conference which, they stated, was a milestone in the history of medical education. An abstract of their speeches is given in the appendix to this chapter.

The Chairman then placed before the house the draft resolutions on the various subjects discussed during the past three days for adoption. The resolutions, taken up one by one and with amendments in some cases, were accepted by the conference. They represented the trends of thought on the multiple facets of medical education and covered a wide ground ranging from pre-medical requirements with its bearing on high school and university education to the teaching of social, preventive and psychological medicine. The resolutions passed by the conference were to be circulated to the universities, medical colleges and the Medical Council of India so as to form a basis on which these institutions might attempt to reorganise their system of medical education. In previous chapters each of these resolutions has been stated at appropriate places. For the sake of convenience and easy reference, they are reproduced in the appendix to the report.

The feature that stood out prominently throughout the proceedings of the conference was the almost unanimous realisation of the inadequacies of the present system and the equally unanimous feeling that immediate steps must be taken to remedy some of the existing deficiencies. No one in the conference expected miracles to happen in the immediate future. The problem of medical education is a complex one and any change from the existing system will mean corresponding change in the general educational system and is intimately linked with financial resources and technical man-power.

The conference deliberately avoided taking strong and rigid positions on various aspects of medical education and stressed throughout the need for an experimental approach. It emphasised that objective assessment should be made of the improvements that are likely to be introduced in the future in different institutions. The delegates went

away with the hope that perhaps after the lapse of a few years, they would come back with the results of their experiences which could then be pooled together in an overall effort to make medical education a progressive and evolving institution.

The Chairman then wound up the deliberations and in doing so stated as follows :—

> "I would like to say a few words to both the delegates and observers who have very kindly taken part in the discussions and have done so much to make this conference a success. I wish to thank the World Health Organisation and the Rockefeller Foundation for the very keen interest which they have taken in the conference. My thanks are due to the Tuberculosis Association of India for making available this hall for the conference and also to the members of the Reception Committee and the various Sub-committee which worked so hard to produce the background material for the conference. I would particularly like to thank the students of the Lady Hardinge Medical College.
>
> I personally feel convinced that the conference has served its purpose and has justified the effort involved in it. I do hope that your discussions and recommendations will go a long way towards reorganising medical education in this country. Our thanks are due to the Government of India for providing the necessary funds and facilities for holding the conference."

On behalf of the delegates, Lt.-Colonel Sangham Lal proposed a vote of thanks. He said :—

> "I wish to thank on behalf of all of us Rajkumari Amrit Kaur, Union Health Minister, for having organised this very useful conference. Next I want to thank the officers of the Central Ministry of Health. In this connection special mention has to be made of the efforts made by Dr. C. G. Pandit, Dr. K. C. K. E. Raja and Dr. R. Viswanathan. We have all read with great interest the exhaustive notes supplied to us and for this the credit goes to Dr. K. C. K. E. Raja, who has devoted a good deal of his time and thought to this work which may or may not be a part of his legitimate duties. I wish to thank Dr. B. C. Roy for so kindly sparing a couple of days for us to guide the deliberations of this conference with his wide and mature experience. To you, Mr. Chairman, we offer our grateful thanks for conducting the proceedings of this conference in such an efficient manner during the last two days. I also wish to extend a hearty vote of thanks to the Government of India for making it financially possible for us

to be here and enjoy their hospitality. We appreciate the excellent way in which the conference has been conducted."

Dr. C. S. Patel, President of the Medical Council of India then spoke in appreciation of the achievements of the conference and of the efforts made by the Government of India and the members of various Sub-Committees. He identified himself entirely with the sentiments expressed by Lt. Colonel Sangham Lal.

As the conference rose, Dr. V. R. Khanolkar made the following statement :

"This Conference is a very happy augury for the future of medical education in the country. I appreciate the way the Medical Council of India has helped us. I hope this betrothal will become a marriage in the future and we shall all of us work as one happy family. I therefore not only associate myself with Lt.-Colonel Sangham Lal in thanking you and the drafting committee which have drafted so vigorously and well, during all these days, but I should also like to offer thanks to Dr. Patel and his colleagues for the manner in which they have promised to cooperate with all efforts at improving the standards of medical education in this country".

ABSTRACT OF PRESENTATIONS

Dr. Grzegorzewski (W.H.O.)

In the absence of the Regional Director, Dr. Mani, I wish to convey to you the greetings and satisfaction of the W.H.O. for the splendid achievements which we witnessed for the last three days and for all the background work which made those achievements possible. Our organisation takes a profound interest in medical education. I should like to take this opportunity to make a few remarks as to how your achievements in this country have a bearing on the global picture of development of medical education. First of all, there is the question of the recognition of the existence of the problem. In some countries where medical education was developing for centuries, it came to a point of stagnation in spite of the prevailing changing conditions, therefore, any progress should start from the recognition that what was good in the past is not necessarily sufficient for to-day and still less for tomorrow. Your leading educators and representatives of health are aware of this situation. This is not the case in all the countries, even in those countries which technologically are in a more fortunate position. Therefore, you have shown great leadership not only within your country but also for many other countries, in other parts of the world.

I was particularly pleasantly struck with the strong emphasis you laid on the social responsibilities of the medical profession and the

medical teaching institutions. This is a very good augury for rapid development.

I do not think we can help you much on the subject side of the problem because the comprehensive reports submitted by the various Sub-Committees cover almost every aspect of the problem. I would, however, refer to the documents 1 and 3 circulated to the members. The discussion here stressed particularly the need for research. Constructive remarks were made about the creation of a proper atmosphere of research in medical colleges. Reference has also been made to the problem of service, service to the teaching institutions, to the community, to the country and to the people. This service is not only a matter of routine performance but also of the highest importance in maintaining proper standards of medical aid applied to all communities. It serves as a link between medical science and its application, a channel through which the progrees of medicine is translated into practical action of the every day world.

You are passing through a period of national development. You have achieved national independence which means not only political independence but complete economic, social and cultural independence. It is but right that as the medical and cultural situation improves, medical education should also improve. We can also look at the problem from another angle, *viz.,* to what extent progress in medical education is a constructive factor in the promotion of social and cultural level of the country. So, we the medical educators should be in the front line of the general development of the country's economic and cultural advancement. Then there is the question of human resources. It seems to me that for every country, particularly for a country in the stage of rapid and planned national development, a sound management of human resources is essential. The medical-man-power problem in India is particularly important. If I remember aright, at least 15 years will be necessary to secure adequate staffing of our academic chairs in India. If you handle these matters in a planned way, and perhaps sometimes by self-sacrifice, then the atmosphere to which Dr. Yodh referred to yesterday will be created—an atmosphere which will impress upon the student that the process of medical education is a lifelong one.

Perhaps also we may emphasise in our educational programme another aspect which did not receive our attention earlier, *viz.,* that medicine is now a complex type of activity and the medical student should be given to understand that team work with other health personnel is necessary for full realisation of its objectives.

At the end may I look a little bit ahead of what may happen after this conference? The really impressive and progressive resolutions of this conference I hope will not be kept just for the consideration of august bodies, but the lines of thought on different subjects which were so well discussed here will spread all over the medical colleges throughout this country, and that all teaching staff including the most junior assistants, will be permeated with the thoughts and discussions

of this conference. We also hope that these ideas penetrate further into the neighbouring countries and that there will be exchange of experiences not only within a country but also between different countries.

Dr. Ko Lin, China

I am very thankful to the Ministry of Health of the Government of India for inviting us to attend this Conference on Medical Education and for the hospitality shown to us since our arrival. In the past few days we have seen what importance is attached to medical education in your country and the sincere and responsible attitude with which your medical educationists have expressed their opinions. We congratulate you on the success of this Conference and hope that it will be a milestone in the history of education in your country. I should like to take this opportunity of acquainting you with some of the developments in medical education in New China. In Old China before liberation, there were 44 public and private medical schools and these were, as a rule, poorly equipped, had insufficient staff and admitted relatively few students. There was no uniformity in the system of teaching and various systems such as the English, American, German, Japanese and French were being followed. The total number of graduates produced during 60 odd years was only about 20,000 and a great majority of them practised in the large cities leaving the people in the rural areas without modern medical care. After the liberation, the People's Government introduced several reforms in medical education. New buildings and new equipment were provided and higher standards of teaching achieved. At present there are about 30,000 students studying medicine and during the past 6 years 17,000 doctors graduated and the number is increasing every year.

In the Summer of 1954, a Conference on Medical Education was held under the auspices of Ministry of Higher Education and the Ministry of Health. The aim of college medical education was clearly defined as training persons in the medical and health cadres in modern scientific knowledge and techniques of medical sciences in order to serve the people in our national socialistic reconstruction. The Conference formulated a new curriculum for five Faculties, namely, Medicine, Public Health, Paediatrics, Pharmacy and Dental Health. The curriculum was based on the experience of the Soviet Union adapted to the local conditions in China.

The reform of medical education in China consists of radical changes in the organisation, content and method of teaching. Separate chairs are established for each academic study in every college. We try to integrate theory and practice. Oral examination is the method of our choice in assessing candidates and is being substituted for written examinations. In the teaching programme the history and contributions of our indigenous systems of medicine are included. Hospital work and clinical teaching are being integrated. The teaching hospital strives constantly to raise the quality of its service and

teaching. This integration corrected the former defect of giving all attention to treatment neglecting teaching.

All students are taught and urged to observe discipline and to understand that the training is meant for the service of the nation. Students willingly join Government services in any part of the country after graduation. The new orientation of medical education is geared to meet the Country's needs in the First Five Year Plan. In spite of these achievements, however, there are still many difficulties and defects in our system. There are insufficiencies in the number of trained personnel and in the quality of teaching. We have yet to make greater efforts to overcome them.

In the short space of time since we arrived in this great country, we have besides attending this Conference seen some of the achievements in the field of medical sciences and research all of which have been of great help to us. We firmly believe that mutual visits and understanding and interchange of ideas on the part of the medical profession will be of inestimable value in the development of medical science in our two countries.

Dr. Ba Than, Burma

The problems in our country and in yours are almost identical although yours being a bigger country you have bigger problems. One thing which made me feel very happy was the statement by your Minister for Health, Rajkumari Amrit Kaur, that the medium of instruction in medical education will be English for the time being. I am very glad to hear it. Countries like India, Burma and Indonesia, which have recently attained Independence, must realise that the English language is a good medium of understanding each other and that is why I am able to understand all your deliberations.

We have a population of 17 millions in Burma and we have very few doctors. We have now reorganised our educational system and added the basic science subjects in our high schools. When the students complete their matriculation and enter the universities they now undergo a course of one year instead of two years before entering a medical school. We have no premedical studies. We do not exclude anybody from the medical college because of the great need for trained personnel. Medical education has now become very popular. During the past three years 140 to 180 students were admitted each year and this year the number has gone up to 200.

I would like to express a few personal opinions of mine regarding your deliberations. I am a Professor of Surgery and I am also interested in the teaching of anatomy. I quite agree that it is waste of time to teach detailed anatomy in the preclinical years but I do feel that a certain amount of dissection work is necessary. I also feel that anatomy and physiology should be taught together and not in water-tight compartments. Anatomy is a dull subject to most of the students and its teaching should be made a little more interesting.

With regard to didactic lectures I think for some time to come we still have to give them although I quite agree with Dr. Yodh's point. We have internship for one year at the end of the five years course and we make an exception in this regard only in the case of army personnel.

Examinations must be there for some time to come until we find a better method of assessing the students. Written examination helps a student to think for himself and is a form of finding out how much a student knows. We should also retain the oral examination as it requires the student to think quickly and give the answer. In my opinion, therefore, we shall retain the whole system of written, oral and clinical examination because from this we can test the memory of the student. Memory is absolutely necessary for a medical man.

The other day I heard that in the matter of promotion, seniority should be taken into account and that the retiring age in the case of teachers should not be 55. Retiring age was fixed at 55 in the days of the British but now in the new set up of things we have to reconsider this question. In my opinion, it is only at the age of 55 that persons are really mature in experience and we can derive a great deal of benefit out of their knowledge and experience. So, I think we should try to raise this age of retirement. I maintain that age does not matter much especially in the case of physicians. Perhaps a man is as old as he thinks himself to be. A surgeon after a certain age may not be able to perform strenuous operations but can help the authorities by his advice and consultation. A Physician on the other hand is in a relatively better condition.

I would like to say a few words about rural health. 80 to 90 per cent. of the total population of our countries lives in small towns and villages. While Governments are spending much money on medical education and medical aid, only the town people are mostly benefited by it. We have a two years' course to train health personnel to work in the villages. The basic subjects anatomy and physiology are taught to them and the main emphasis is on the preventive side of medicine. They are trained for Village Health Units in the first instance, then for Town Health Units, then for Divisional Health Units and ultimately for District Health Units.

Finally I would like to say that we look forward to India for guidance and we are very glad that the first Medical Education Conference has taken place here. I am already a member of the Association of Surgeons of India so that I am always in contact with my brother Surgeons in this country.

Sir Nicholas Attygalle, Ceylon

I am very grateful for the privilege of attending this conference. We have had a very interesting discussion and we have benefitted by it. The method of recruitment to the medical colleges, methods of examinations and methods of instruction have all been gone into very carefully and many questions have been thrashed out fully. We in

Ceylon which has been closely united with India for a very long time not only in culture and education but even in medical education, always come to India for inspiration and guidance and this Conference has given us both.

Our method of selection is slightly different from what has been advocated here. After matriculation, the students receive two years University education in which Physics and Chemistry are compulsory subjects. Proficiency in subjects like Latin and Greek are also taken into account and after the examination we assess the value of students by an interview and reports from their headmasters. We select out of six hundred candidates only a hundred and twenty. Then we have a preclinical course in Chemistry, Physics, Physiology and Anatomy for one year and nine months. After that we allot three years for clinical work. Then we have internship for another year. We lay special emphasis on Paediatrics and Public Health and for the last six years there has been a separate Chair for Paediatrics. After a number of years of experience, we found that these two subjects require special emphasis in our country.

We unfortunately, lay little stress on the social problems and the humanity side in the curriculum of the medical schools. But after the discussions we have had here, we shall certainly take into account all the subjects you have emphasised and try to incorporate them in our curriculum.

Last but not the least is the examination system. We have for a number of years laid special stress on the clinical part of the work and less on theory. Our examinations are conducted in three parts theory paper, clinical examination and *viva voce*. Out of these, least attention was paid to the written paper for a number of years.

I was greatly impressed with the special attention paid by this Conference to internship period. We have initiated an internship programme only from last year in Ceylon. In our country the recruitment of teachers is a complex problem because it is bound with the recruitment of teachers to all the Faculties of the University. We have a Selection Board consisting of three persons with special knowledge of the subject and four outsiders who have no special knowledge of the subject with the Vice-Chancellor as the Chairman. Selection for a Chair is widely advertised not only in Ceylon but also in India, in the U. K., Australia, Canada, etc.

We are very grateful to you for having permitted us to attend this Conference and for the hospitality you have shown.

Prof. Soetarman, Indonesia

On behalf of the Indonesian delegation we convey our sincere thanks to our friends in India who invited us to this meeting. After hearing the discussions, we learnt that the problems in medical education in India are similar to those in our country. At the moment there are four medical faculties in Indonesia of which the oldest one

is in Djakarta. The others are in Surabaya, Jogdjakarta and Medan. This year we have founded two more medical faculties of which one is under construction. Thus in the near future we shall have in all six medical faculties. We are making some experiments in medical education in Djakarta which might be of interest to you. Until recently we had an educational system based on the Dutch system which is similar to the German system. The medical course consisted of five years. During the first year we were teaching basic sciences-physics, chemistry, botany and zoology ; second and third years were dedicated to anatomy, physiology, histology and biochemistry and fourth and fifth to clinical studies. At the end of the fifth year there was an examination for the doctorate degree. The sixth and seventh years were dedicated to internship and after the 7th year the students were registered and licensed to practice.

We found that this system was not along proper lines. So, two years ago, we succeeded in introducing a curriculum which is distributed somewhat as follows :—

The first year is dedicated to the basic sciences, physics, chemistry and biology and social sciences. The second year for nonclinical subjects like anatomy, physiology, histology and biochemistry. In this year the teaching of public health, nutrition and malariology is started.

In the third year the students are introduced to clinical subjects and in the fourth and fifth years they are put on clerkship and general clinical studies.

The sixth and seventh year are dedicated to internship, after which the students are registered and licensed to practice.

As our first foreign language we now learn English so as to enable us to communicate with the countries in our neighbourhood. I think if conferences like this can be held not only here but also in other countries, it will be of great value.

Dr. Luang Binbakya Bidyabhed, Thailand

I rise to speak before this distinguished audience with humility coming as I do from a small country like Thailand. It was a great privilege and honour to have come here to take part in the deliberations of this conference for which we are grateful to the Government of India for their kind invitation and also to the World Health Organisation. I also wish to express our thanks for allowing us to take part in your deliberations, in your great fight to uplift the standard of medical education in this part of the world. We have heard a lot and gained a lot from India, the mother of our national religion and culture. Even our own names and many of our words of daily usage are derived from Sanskrit words. Ours is a small country of 20 million population with only two medical colleges for the whole

country. The first school of modern medicine was established in Bangkok in 1839 to which was attached the first modern hospital in Thailand. During the last 60 years we have been trying to produce doctors for our medical and health services. We are greatly indebted to the Rockefeller Foundation through whose generous assistance we have started a programme of complete reorganisation of medical education in our country. At first we were admitting only 25 students in a class, but the enrolment gradually rose and before the Second World War we were able to admit 75 students in a class. However, following the war years, the demand for doctors increased and in 1947 a second medical school was opened. We are now producing about 200 doctors a year in our country. There are 1,000 medical students in the two medical schools with limited number of teachers and limited facilities for training. We have difficulties concerning the selection of students, training of students, selection and recruitment of teachers and also shortage of funds. One of the most pressing problems concerning medical education in our country right now is the revision of the curriculum to make it conform to modern trends in this field. I have attended several conferences on medical education. Your conference has been an eye-opener for us from Thailand. It has given us so many ideas. Some of your decisions and resolutions will certainly serve as a guide for us in tackling our problems with confidence and courage.

Dr. Alan Gregg, New York

First of all I wish to express the pleasure that I have derived from seeing so many of the persons whom I saw during my last visit to India a few years ago. As I mentioned in my talk at the beginning of this conference, it is difficult to convert one's thoughts and ideas in a short time. We have to allow some measure of difference of opinion and have also to emphasise that people take to change very slowly. People come to meetings mostly with set ideas and thoughts and you cannot just change them immediately with any number of arguments even though they may be very convincing. You will hardly find any person in a gathering of this type who will stand up and say that he had held a different view but that he is now convinced of the arguments advanced by you and has completely changed his views as a result of that.

The second thing is that I do not think that a conference like this should be closely associated with governments. People do not want to feel the pressure. Now, there is a proverb which says that " nothing succeeds like success ", but the editor of the New York Times came to amend it by saying that " nothing succeeds like successors ". In other words, we must be willing to stop our lovely labours when the time comes and teaching, gentlemen, is one of the few ways in which you can become, in a certain sense, immortal. I am reminded of a story regarding a man's birth, age and death and the only thought left with the man was " I expected death but not so soon ".

I have been a little struck in these meetings by the fact that there has been so little reference to the difficulties of the students from the students' point of view. We were discussing examinations. It would indeed be interesting if some of our friends here asked themselves how many of them failed in more than two examinations. In examinations we should not allow the best boys, whom we have ourselves selected to be fit to become doctors, to be ploughed by rejecting them in toto. Examination has two purposes essentially—one is to keep the student out of the college environment from across the fences, so to say, and the other is to see how strong and fine young men are because an examination measures how high they can jump. My own feeling of examinations is that they are overdone. Please do remember that a medical course is used in so many different ways that I frankly do not believe that it is wise to be too strict in examinations.

I think this is the utmost that I want to say to reiterate my views and I express my gratitude for being invited to the conference. I wish we could return always to the thought that we are all human beings and that we all have limitations, more especially those who work hard. It would be a very valuable thing if we could think of ethics and morals from the experimental standpoint. For instance, it is extremely difficult to be listening seriously to me for 15 minutes but that will be a sort of experiment. In other words, I approach the question of moral ethics from experimental standpoint and I plead forbearance for other people as these morals and ethics turn out to be important factors, or rather determining factors, in progress of any kind.

APPENDIX I.

Resolutions passed by the Medical Education Conference, held in New Delhi, from 19th to 22nd November, 1955.

1. PREMEDICAL STUDIES AND ENTRANCE REQUIREMENTS.

The Conference considers that the training programme recommended by the Mudaliar Commission on Secondary Education, including the proposal for a pre-professional course of one year, will meet the minimum requirements of pre-medical education and, that pending the introduction of the changes suggested by that Commission, the passing of the Intermediate Examination of Indian Universities with science subjects should continue to be the minimum qualification required for admission to a medical college.

The suggestion was put forward that the selection of a student for medical training might be carried out after S.S.L.C. or Matriculation examination and that an attempt should be made to modify the training of the selected student during the Intermediate course so as to equip him better for medical education. In addition to Physics, Chemistry and Biology it is desirable to include, as far as possible, elementary mathematics, elementary genetics, logic, psychology and English.

2. SELECTION OF STUDENTS.

Taking note of the difficulties arising from the different methods of selection of candidates for admission adopted by various medical colleges in the Country, the Conference considers that the development of common criteria for selection may have to await the reorganisation and improvement of secondary education on the lines recommended by the Mudaliar Commission. In the meantime the Conference recommends :—

(1) that, for the next few years, each college should continue its own method of selection taking into account the desirability of including in the criteria for selection (a) the academic record of the student and (b) his extra-curricular activities ;

(2) that, in assessing the academic record, the student's performance at the Matriculation or S.S.L.C. examination and the Intermediate Science examination should be taken into account as well as his class records for two or three years immediately preceding his admission to the medical college ;

(3) that, after a preliminary scrutiny and elimination of those who do not fulfil the minimum requirements applicable to all candidates, the others should be interviewed by a committee, the main purpose being to ascertain the nature of the extra-curricular activities

of the candidates and to assess the value to be attached to them in the case of each student ;

(4) that, taking note of the fact that, under existing conditions, the allotment of a certain proportion of seats for candidates from some special classes of the community is inevitable in certain parts of the country, the minimum standards prescribed for these classes may be fixed at a lower level than for candidates in general and that, if none of the candidates in these special classes comes up to the level of the prescribed lower standards, the seats may be turned over to the general pool ;

(5) that, records regarding selection should be kept so as to bring out, in the case of each candidate, (a) his academic records, (b) his extra-curricular activities and (c) the results of personality and aptitude tests and of any other special tests that may be employed ; and

(6) that the data so collected should be reviewed periodically in order to evolve suitable criteria for adoption by the country as a whole.

3. SUBJECTS OF STUDY AND CURRICULUM HOURS.

The Conference recommends that the suggestions regarding curriculum hours on different subjects of the medical course, which are set out in Appendix I of the report of Sub-Committee II, should be circulated to the universities and medical colleges as the basis for a reorganisation of their undergraduate teaching programmes and that, after a period of two years, the results of such reorganisation be reviewed in consultation with all relevant authorities.

4. CONSOLIDATED RECOMMENDATIONS ON PREVENTIVE AND SOCIAL MEDICINE, RURAL EXPERIENCE AND BIOSTATISTICS.

1. There should be a Department of Preventive and Social Medicine in each medical college with full-time staff.

2. The teaching of the department should start with the first year of the medical course and run through all the succeeding years, including internship. The distribution of hours and courses of instruction are indicated in Appendices I and V of the report of Sub-Committee II.

3. The teaching of the department should be integrated with the teaching of all the departments of the medical college. For instance, a coordinated outpatient service should be developed in which students, accompanied by medical social workers, follow the patient to his home and are helped to study the social environmental and other factors relating to his illness, the concerned department such as Medicine, Surgery, Paediatrics, Psychiatry, Obstetrics and Gynaecology also participating in this joint study. Such a study should be followed by a seminar in which all the concerned departments participate.

4. Rural and urban health centres should be associated with the Department of Preventive and Social Medicine. They form the laboratories in which practical experience can be acquired by the student and studies in community health problems can be promoted, the student being encouraged to participate in such studies. The Department of Preventive and Social Medicine will be in charge of these health organisations.

5. The Rural Health Centre will provide the necessary facilities for giving rural experience to the students.

6. A separate examination in Preventive and Social Medicine should be part of the final M.B.B.S.

STATISTICS.

(1) The pre-medical training given to the prospective medical students should include elementary mathematics so as to provide a basis for his subsequent training in Statistics during the medical course.

(2) A compulsory course of elementary statistical training should be provided for all students in the preclinical period, the experimental data from field surveys and laboratory work, especially on physiology and pharmacology, being utilised for practical training.

(3) An elective course during the clinical years should be available for those who are interested, a fuller study of epidemiology also being associated with it.

5. PAEDIATRICS

In view of the vital importance of Paediatrics in the overall programme of undergraduate medical education and in view of recent developments in the subject, the Conference recommends :—

1. that a separate Department of Paediatrics should be established in each medical college ; and

2. that a period of not less than three months should be devoted to its study, which should include neonatal paediatrics and growth and development of the child.

6. PSYCHOLOGICAL MEDICINE

The Conference considers that, towards a psychological and psychiatric orientation of the medical student, teachers of nonclinical and clinical subjects can also contribute a great deal in addition to the contribution made by the psychiatrist and that, in undergraduate teaching, such orientation of the student is more important than the actual content of psychiatry which he is taught. It therefore recommends :—

1. that teachers of Embryology and Physiology should emphasise the influence of function on structure and the influence of stress and anxiety on conditions associated with homeostasis, and with digestive, cardio-vascular and neural physiology ;

2. that the psychological and sociological influences in illness should be stressed by the respective professors of Medicine, Surgery, Obstetrics and Gynaecology, and especially Paediatrics ; and

3. the following tentative suggestions be considered as part of the training programme in Psychiatry :—

(a) 10 lectures on psychology to second year students ;

(b) 10 lecture-demonstrations on personality in the third year ;

(c) attendance at neuro-psychiatric and paediatric clinics ;

(d) 12 lecture-demonstrations in a good mental hospital ; and

(e) participation, during field work of the Department of Preventive and Social Medicine, in the study of mental health problems.

7. POSTMORTEM EXAMINATIONS.

In view of the present utter inadequacy of postmortem examinations and in view of their importance for increasing accuracy in diagnosis and thereby promoting the growth of clinical acumen and an improvement of the teaching of Medicine, the Conference recommends :—

1. that the clinical staff should make every endeavour to educate patients and their relatives in regard to the value and importance of postmortems and to persuade them to give their consent to such examinations, when considered necessary ; and

2. that legislation be also promoted to make it possible that, in teaching hospitals, any death, in which a definite diagnosis of the disease is not made, can be subjected to postmortem examination when considered desirable by the hospital authorities.

8. EXAMINATIONS—ASSESSMENT OF THE STUDENT'S PROGRESS

The Conference is unanimously of the opinion :—

(a) that the present methods of examinations and assessment are unsatisfactory ;

(b) that written examinations require considerable modifications ;

(c) that much greater importance be given to the day to day assessment of the student during the period of study than is being attempted at present ; and

(d) that it is necessary that scope should be given to experiments in assessment by such medical colleges as are willing to undertake them.

9. SELECTION OF TEACHERS AND CONDITIONS OF SERVICE

The Conference recommends :

1. that teachers in medical colleges maintained by Governments be selected by a Committee, the membership of which should include a member of the Public Service Commission and at least two experts in the subject for which selection is being made ;

2. that, for a non-governmental college, such selection should be made by a committee in which should be included as members at least two experts in the subject for which selection is made ;

3. that teachers should be paid adequately to attract and keep talent of a high order to man the medical colleges and that these teachers should be assured of security of tenure ; and

4. that all higher teaching posts should be filled by open competition, in which junior teachers in the college concerned should also be permitted to participate.

10. (i) THE ESTABLISHMENT OF FULL-TIME UNITS IN EACH DEPARTMENT OF A MEDICAL COLLEGE

The Conference considers that, in order to bring about a definite improvement in teaching and to promote research, at least one full-time unit should be provided in each department of a medical college, the members of which will be given satisfactory scales of emoluments and will be prohibited private practice of every form.

(ii) THE TEACHER-STUDENT RATIO

In order to implement the various recommendations made by the Conference for improving medical education an essential step is to raise substantially the existing teacher-student ratio in the medical college. A satisfactory ratio to be aimed at will be, it is suggested, one teacher to five students.

APPENDIX II (1)

REPORT OF THE SUB-COMMITTEE (I)

MEMBERS :

Dr. J. S. Carman

Dr. S. N. Das Gupta

Dr. R. Viswanathan

Dr. V. S. Mangalik (Convener).

The terms of reference for this Sub-Committee were:—

(i) Pre-medical studies; desirability of reorientation and more emphasis on non-scientific subjects in the preparation of a prospective medical student.

(ii) Entrance requirements.

(iii) Selection of students on the basis of academic records or Admission examinations and other tests, or Interviews; Tests for physical fitness.

Three meetings of the sub-committee were held in the months of April, June and September.

The various documents and memorandum available for study to the Committee were:—

1. A note on Medical Education by Col. P. C. Dutta.
2. A note by Dr. K. C. K. E. Raja on the teaching of humanities.
3. A note specially prepared by Dr. K. C. K. E. Raja for this sub-committee dealing with the recommendations of the Mudaliar Committee.
4. Draft memorandum prepared by various members of the Sub-committee from time to time.
5. Replies to questionnaire from various Medical Colleges regarding the existing methods of selection in those institutions.
6. Records of statistical investigations undertaken at Lucknow to test the validity of the Pre-medical Test at Lucknow University for admission to Medical Colleges, in relation to the subsequent performance by the students during the medical course. This investigation was financed by I.C.M.R., with close association and under the direct supervision of the Head of the Department of Statistics of Lucknow University. The techniques used in this investigation were:—

Product moment correlation coefficient; Coefficient rank correlation and Biserial corelations. A positive association between the P.M.T. performance of a candidate with his subsequent performance at at the Medical Examination was found. The magnitude of this correlation is rather small.

7. Note on the validity of Vellore Medical College selection methods of the methods taken into consideration, the one which showed the greatest correlation was the performance at the General ability Test as given by them.

8. A report from the National Board of Medical Examinations in U.S.A. on the Validity and Reliability of the New objective test developed by the Board.

Recommendations :—

Terms of Reference Nos. (i) & (ii), Pre-medical education and entrance requirements have been considered together. The Committee has taken cognizance of the following facts in formulating the recommendation:—

(*a*) the mental immaturity of the average medical student;

(*b*) his more or less total ignorance of the some of the non-scientific aspects of general education as Humanities, Social Sciences, Psychology, Mathematics, Language-Regional, National or foreign-Subjects which contribute to a broad based general education. This type of education, the Committee feels is absolutely necessary for those who are preparing for entering the medical profession.

(*c*) that with the training and education, the average present day medical student is not ably "to learn" though he may be prepared "to be taught";

(*d*) the present "fluid" state of our pre-university education particularly in view of the recommendation of the Mudaliar Committee regarding:—

1. the abolition of the Intermediate Examination;
2. the institution of a higher secondary school course;
3. the 3 year degree course at the University level;
4. the institution of one year pre-professional training in states not prepared to start the Higher Secondary course.

The Committee realizes that it will take some years before the recommendation of the Mudaliar Committee will be accepted and given effect to by various states.

Hence the Committee recommends :—

1. The minimum entrance requirements to be a B.Sc. degree of an Indian university or a comparable degree of a foreign university with I.Sc. in Physics, Chemistry, Biology.

2. That the 'One year course' of pre-university training or pre-professional training will not bring about the required change in the mental maturity and cultural broad based training of the medical student.

3. That during the period of transition from the present to the implementation of the 3 year degree course, efforts should be made by a committee consisting of University teachers of Arts, Humanities and Science subjects with the help of Medical educationists to carefully go into the question of evolving a B.Sc. course of 3 years aimed at giving the student:—

(*a*) A broad based education in natural sciences and Humanities, etc., and language.

(*b*) That such courses should be evolved which will prepare a student not only for entrance to Medical College but also for other post-graduate studies in sciences and arts and other special fields as the student may choose to follow after obtaining this degree.

4. The committee feels that given the time and the necessary co-operation of university teachers of science and arts, it will be possible to formulate such a broad men of science and arts faculties. We need the co-operation and the knowledge of them who are familiar with the development and trends in university education in foreign countries and are alive to the realities of the situation in this country.

The Committee is of opinion that the special B.Sc. course should not be given in the medical colleges but should be given either in the universities or in the science colleges affiliated to the universities, as the case may be. The reasons are as follows:—

(1) Candidates for admission to the medical colleges should have had already the full and valuable experience of college and university life up to the degree level before they start medicine.

(2) Full participation in undergraduate college life and all that this means, cannot be complete at the inter-level, certainly not with only a "pre-university" year, and needs to go on to the degree level; it cannot be obtained if the pre-medical students are mixed up with medical students at the medical college.

(3) Students need not necessarily have fully decided to study medicine when choosing to take this type of liberal education course for a degree. This type of course has been found very useful in other countries, and will be in this country for those preparing for good citizenship in the modern world, as well as for work in many types of higher Government position, positions in industry, and for a higher type of post-graduate as a law course, etc.

5. The Committee feels medical studies should be run as a post-graduate course parallel to post-graduate studies in Science and other subjects, and not, as at present, parallel to the common undergraduate studies as B.A., B.Com. or B.Sc.

6. The Committee feels that there will be no difficulty in getting sufficient number of graduates of science for admission to Medical Colleges. In Medical Colleges when admission is made by an entrance examination the majority of students admitted are those who have either obtained the B.Sc. or have studied at least for one year in the B.Sc. classes.

7. The recommendation that B.Sc. as minimum entrance requirement be prescribed immediately without waiting for the development of a B.Sc. degree of the type ideally suited for giving Medical education.

Selection of Students

After reviewing all the different methods of selection adopted in Indian medical colleges and studying the reports from Lucknow and Vellore on the validity of tests used in their respective medical colleges, the Committee recommends the following with regard to the selection of students for admission to medical colleges:—

1. Admission should be based on merit determined by competitive tests.
2. All candidates for admission should undergo a written examination in (a) chemistry, (b) physics, (c) biology (or Botany and Zoology), (d) 'General Ability', (e) 'English Comprehension'.

The written examination may be either "Essay Type" or "Objective Type" or both.

Every candidate selected for medical course should undergo an examination for physical fitness which should include radiological and other examinations before he is admitted to the course.

The Committee recognized that by adopting the recommendations for entrance requirements the pre-medical and medical courses will necessarily be lengthened. The Committee, however, believes that the medical course can be considerably shortened by—

(*a*) reducing the number of holidays,

(*b*) reducing the time taken for university examinations by changing the methods of examination and eliminating "Revision Holidays";

(*c*) conducting the university examinations during holidays.

APPENDIX II (2)

REPORT OF THE SUB-COMMITTEE (II)

AND

ITS STUDY GROUP DEALING WITH CURRICULUM HOURS, METHODS OF TEACHING, INTERNSHIPS, ETC.

GOVERNMENT OF INDIA

MINISTRY OF HEALTH

MEDICAL EDUCATION CONFERENCE

REPORT OF THE SUB-COMMITTEE (II)

AND

ITS STUDY GROUP DEALING WITH CURRICULUM HOURS, METHODS OF TEACHING, INTERNSHIPS, ETC.

Members of Sub-Committee II

1. Dr. S. G. Vengsarkar (*Convener*)
   Dean, Seth G. S. Medical College, Bombay.
2. Dr. S. T. Achar,
   Pediatrician, Madras Medical College, Madras.
3. Dr. A. N. DeQuadros,
   Principal, Medical College, Baroda.
4. Dr. G. M. Kurulkar,
   Professor of Anatomy, Seth G. S. Medical College, Bombay.
5. Dr. S. K. Menon,
   Principal, Medical College, Jaipur.
6. Dr. Carl E. Taylor,
   Professor of Preventive Medicine and Public Health, Medical College, Ludhiana.
7. Dr. B. P. Tribedi,
   Retired Professor of Pathology, Medical College, Calcutta.
8. Dr. B. B. Yodh,
   Physician J. J. Hospital, Bombay.

Members of Study Group

1. Dr. B. B. Yodh (*Chairman*)
2. Dr. S. T. Achar, Madras Medical College, Madras.
3. Dr. B. K. Anand, Lady Hardinge Medical College, Delhi.
4. Dr. S. P. Jain, Medical College, Agra.
5. Dr. G. K. Karandikar, Baroda Medical College, Baroda.
6. Dr. S. K. Menon, Medical College, Jaipur.
7. Dr. P. N. Wahi, Medical College, Agra.
8. Dr. Carl E. Taylor, Medical College, Ludhiana,

A Joint Meeting of Sub-Committee (II) and its Study Group was held on the 1st, 2nd and 3rd September, 1955, in the Cancer Research Centre, Bombay. The Committee co-opted Dr. V. R. Khanolkar as a member.

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Early in their deliberations the Committee came to the conclusion that they could not adequately deal with the subjects referred to them unless they had also discussions among themselves on other relevant aspects of medical education, such as pre-medical studies, selection of students, question of examinations, etc., even though these items had been entrusted to other special committees for consideration and report. The Committee had, as the result of a decision at an earlier meeting, circulated a questionnaire dealing with some of these questions to the Faculties of all medical colleges in the country. Twenty-four colleges sent their replies to the questionnaire and the Committee had therefore before them the views of these medical institutions.

The following agenda was adopted:—

a. Selection of students.

b. Curriculum hours—preclinical and clinical.

c. Methods of teaching, didactic and practical, integrated teaching of clinical and preclinical subjects.

d. Subjects needing special emphasis, *e.g.* Preventive and Social Medicine, Pediatrics, Psychiatry, Bio-statistics.

e. Internship.

f. Examinations.

The Committee report has been in three Sections. Section I deals with the recommendations of the Committee as a whole, Section II with a detailed account of the discussions that took place, and Section III with special memoranda on important fields of medical education submitted to the Committee. These are reproduced here in the same order.

SECTION I.

1. *Recommendations*

1.1 It is suggested that the subjects in the last year of the secondary school period (in case of new rules) or the first year of the college (if present S. S. C. years are not changed) should include English, Methods of reasoning, Literature, History, Social Sciences, Mathematics and Elements of Natural Sciences (2.3.3., 2.3.4.).

1.2 *Selection of Students*

In selecting the students for medical course individual institutions may employ methods of selection such as entrance tests, interviews, or any other procedures. *A review of all the methods employed in the selection of students should be made at the end of five year interval.* It is suggested that the following conditions should be observed: (2.3).

1.2.1 Students should have completed 17 years before entering medical course.

1.2.2 The selection of students should be made after one year of college study after the S.S.C. (11 years of secondary school training as at present).

OR

after the end of the secondary school period if this is extended to 12 years.

1.2.3 The selection should be based on:

1.2.3.1 Academic performance from the 8th standard in the school.

1.2.3.2 Extra curricular activities.

1.3 *Pre-medical Course*

During the year preceding the commencement of medical studies, students selected for medical course should be instructed in Physics, Chemistry, Biology, Elementary Statistics, Elementary Genetics and English.

1.4 *Medium of instruction*

The medium of instruction should be the language which is decided upon by the University in the region concerned.

A good knowledge of foreign languages, particularly English, should be imparted during the whole of the undergraduate period (2.4).

1.5 *Assessment*

As the present system of medical examinations is an obstacle in the progress of medical education, the following suggestions are made:

1.5.1 The written or theoretical portion of all examinations should be abolished.

1.5.2 50 per cent. of the credit in such examination should be assigned on the basis of day to day work. The evaluation of a student's progress should not be carried out by a simple process of mathematical averages, but taking a comprehensive view of his entire progress.

1.5.3 The medical schools should be permitted to evolve their own methods of assessment

1.6 *Duration of the Course*

The duration of the medical course should be $4\frac{1}{2}$ years followed by compulsory internship for one year (2.6).

1.7 *Selection of Teachers*

As the present method of selection of teachers is required to be modified, the Committee makes the following suggestions: (2.7).

1.7.1 Selection Board should consist of one member of the Public Service Commission with two or more eminent teachers in the subject for which the appointment is to be made.

1.7.2 The Selecting and Appointing authority should enjoy a large degree of flexibility in the manner and sequence of appointments to the staff.

1.7.3 Promotion from the post of Lecturer, Reader, or Assistant Professor to the post of Professor in the same institution should be discouraged.

1.7.4 Tenure of service should be on semi-permanent basis, five years renewable on commendable performance, every five years.

1.8 *Organisation of Departments*

As functional unity is desirable in all departments of a medical college, the following suggestions are made: (2.8)

1.8.1 Full time departments should be organised in Medicine, Surgery, Obstetrics and Gynaecology and Anaesthesiology to start with, with a full time head of the department responsible for the direction and co-ordination of teaching and research activities.

1.8.2 Each department should consist of a nucleus of permanent staff and a contingent short term staff at all levels except the head of the department. It is further suggested that in the case of tutors and demonstrators, the proportion of full time to short-term personnel should be 1 to 2.

1.8.3 Full time members of the departments of Pathology, Radiology, Biochemistry and Pharmacology should be included in full time clinical departments.

1.8.4 There should be no difference between the general qualifications required and the conditions of service offered to members of the staff of corresponding status in all the departments.

1.9 *Curriculum*

As the course envisaged in the objectives of medical education has to be differently devised, the following may be taken into consideration: (2.10)

1.9.1 A period of equivalent to about 25 per cent. of the total time devoted to instruction in college should be made available to students for elective studies.

1.9.2 Medical institutions should organise for the studies in the college, facilities for training in the cultural aspects of medicine. The subjects may comprise amongst others English, Methods of Expression (verbal and written), Reasoning and Ethics.

1.9.3 Curriculum on the lines shown in appendix No. 1 would serve for guidance in framing courses of study.

1.10 *Methods of Teaching*

The old methods of teaching require much modification and new methods may have to be adopted. Towards this end, the Committee make the following suggestions: (2.10)

1.10.1 The number of lectures should be curtailed in all subjects.

1.10.2 Lecture demonstrations, student seminars, staff seminars, group conferences, should form the principle feature for integrated instruction.

1.10.3 Every encouragement should be given to the students to own his microscope and other useful and optional apparatus.

1.10.4 A good sixe X-ray apparatus should be a necessary equipment for use between Anatomy and Physiology departments.

1.10.5 The time devoted to dissections in Anatomy should be reduced.

1.10.6 In the teaching of Physiology, as far as possible, experiments on human subjects should replace experiments on animals.

1.10.7 A personal relationship in the study of patients should be created by studying his environment, his habits and the progress of his disease. During this period (clinical clerking) the staff and students should work as one unit.

1.10.8 Accurate records of observation in the clinical period should be maintained.

1.10.9 A repetition and undue emphasis in teaching especially in the speciality should be avoided.

1.10.10 From amongst the staff, preceptors should be selected who would take a personal interest and guide a batch of about 10-15 students.

1.11 *Library*

As it is desirable that the students should be encouraged to develop a habit of using the library, the following suggestions should be implemented: (2.22)

1.11.1 Qualified librarian should be in charge of the library.

1.11.2 Library should be kept open for 15 hours on working days.

1.12 *Special Subjects*

As it is desirable to focus the attention of the students throughout the course on positive health, the Committee suggests: (2.27)

1.12.1 That Preventive and Social Medicine and Psychiatry should be taught throughout the course.

1.12.2 That Paediatrics should be taught for 3 months, one month of this training should consist of internship in that subject.

1.13 *Internship*

There should be an internship of one year which should be divided in subjects as under: (2.27)

1.13.1 Medicine
1.13.2 Rural Field Experience } Compulsory

1.13.3 Electives. Other subjects.
Each period should be of three months.

1.14 *Postgraduate training*

As it is desirable that medical men should keep in constant touch with his subject, the following suggestions are made: (2.28)

1.14.1 Medical colleges should organise Refresher Courses for the benefit of medical men in their regions.

1.14.2 That facilities for study leave etc., should be given for attendance at University centres.

1.14.3 Well equipped library and laboratory should be provided at district centres.

1.15 In the interest of medical education, it is highly desirable that a school must be independent for developing its teaching and research programmes, as long as satisfactory standards in medical education are maintained (2.29.2).

1.16 A permanent Committee should be created to help the different colleges by giving guidance and advise in the matter of medical education. One half of the personnel of such Committee should be changed every five years (2.29.2).

1.17 Medical Educationists of the country should confer frequently for discussing their problems through an organisation of an All India nature.

SECTION II

2. *Report of the discussions of the Committee*

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2.1 *Introduction*

2.1.1 Development of medical education in India has not been planned nor has it evolved in a progressive manner. Crude medical relief has so far been the main objective. Lengthening the arms of medical men imported from abroad by providing them local personnel with enough factual knowledge for routine procedures, such as administration of common drugs and recognition of some emergencies appears to have been the goal of medical education when it began in this country.

This state of affairs has not materially altered even now, in spite of the conversion of hospital assistants class to Licentiates and of the Licentiates to Graduates. There are, however, a few exception but these are in the case of special institutions such as the School of Tropical Medicine, Calcutta, and some of the Research Institutions.

2.1.2 The atmosphere began to change during the period of the two wats, when there was considerable exchange of personnel and intermingling of medical men from abroad in the Army. After the war came contacts through well known agencies such as W.H.O., Colombo Plan and some Foundations. A number of medical men from India have also been able to go abroad during the last 7-8 years for studies and as a result of this, in most institutions in the country, there is a sprinkling of these men amongst the staff. It is felt, however, that the attitude of the Central and State Governments has not kept pace with the changed outlook and medical relief of a kind appears to be still the main aim of the administrators.

The Bhore Committee in its monumental Report indicated some of the objectives of medical education and mentioned that the main aim of medical education should be the production of a basic doctor.

2.2 *Objectives of Medical Education*

2.2.1 The Committee had been entrusted with the task of making suggestions for consideration at the proposed medical education Conference with regard to teaching in medical colleges in India. As this was intimately linked with the objectives of medical education, the Committee considered the objectives first.

2.2.2 From the nature of the replies, it appeared that it had been a difficult question to answer in a nutshell. Medical education should aim primarily at producing a doctor who will have studied man as a whole in health and disease and gained knowledge about man as a unified experience. As a result of his training, he would have developed a wide cultural and humanistic background. *The human being is a product of his inherited qualities modified by environmental influences and requires to be studied as a distinct entity.* He should therefore be aware of the social environmental factors that are associated with the sick person and at the same time should be constantly reminded of them when dealing with illness.

2.2.3 The future doctor should possess a positive attitude towards health and therefore should undergo his training with the preventive aspects of medicine throughout the course. He should also understand that education of the public regarding preservation of health is one of the prime functions of a medical man.

2.2.4 Medical teaching should be built round the needs of the student and not be cut to a pattern previously determined in an isolated manner in different departments. The student should therefore be considered as the real unit of education and not as the vehicle of the course or the curriculum. If the education of the student is to be broad based, he should be given opportunities for the study of additional literature and newer experimental techniques by providing him with enough free time.

2.2.5 It is necessary that greater stress should be laid on the methods to be employed in the acquisition of knowledge rather than acquisition of a mass of facts and techniques in an un-coordinated manner. A student when he finishes his career should have developed an investigative and a critical mind.

2.2.6 Whether the object of training of the future doctor is to make him a rural practitioner or an urban practitioner or a teacher or a research worker of any combination of these, is of secondary importance. It is more important to keep the fundamental principles enunciated above constantly in mind throughout the training. As a result of cohesion between various subjects he will obtain knowledge as a unified experience during his course.

2.3 *Selection of Students*

2.3.1 In order to achieve these objectives, it was necessary to consider that background of the student before he was selected as fit to enter the medical course.

2.3.2 At present in India, vast changes in the pattern of secondary education are in the offing. It is likely that the period of secondary education may be increased by one year. It is also likely that an intermediate stage of two years will be required by the University before preparing for final graduation in other faculties which means 3 years after the end of the newly envisaged secondary school course. The Committee feels that a student should have completed 17 years before entering the medical course. Selection of the student should be made after one year of College after S. S. C. in the present set up of 11 standards in the schools. If the proposed change of adding one more year to the secondary schools is adopted then he would be selected at the end of the secondary school period

2.3.3 It was pointed out in the Committee that in countries such as U. K., France, Germany and Russia selection of medical student is made at the end of higher secondary school education.

2.3.4 After selection is made the student should be required to undergo a suitably devised pre-medical course either in a medical college or in the science college. Such a course should be formulated by close collaboration between the medical, arts and science faculties. In case a student reaches the end of his higher secondary school period at an earlier age, he should be offered a wide choice of elective courses of four months each in various subjects such as Humanities, Psychology, Social Sciences, Higher Physics, Biology, etc.

2.3.5 It was necessary to consider carefully the subjects of instruction in the two years before the pre-medical course and the year of the pre-medical course. It is essential to see that wide cultural background and humanistic attitudes are developed at this stage. Subjects of instruction in two years before the pre-medical year should include English, methods of reasoning, literature, history, social sciences, elementary mathematics and elements of natural sciences. After selection and in the pre-medical year, the subjects recommended are elementary statistics, elementary genetics, physics, chemistry, biology and English.

2.3.6 Some latitude may be given in the academic requirements for admission to medical institutions. Some of them may admit students even after graduation if they so desire. This will have the advantage of the student having a sound and a more comprehensive preparation for the medical course.

2.3.7 It was felt by some members that in making the selection of the student for the medical course, two main principles should be kept in view :—

(*a*) Consideration should be given to the academic performance of the student from the 8th standard to the end of the first year in the Arts or Science college or to the end of the higher secondary school if the new proposal of adding one year to the secondary school period is in force, and

(*b*) Extra curricular activities which fall in the following groups:

(i) Activities in national bodies like National Cadet Corps, Auxiliary Cadet Corps, Red Cross, Bharat Sevak Samaj and such other All India or similar State Bodies.

(ii) Outstanding social activities in rural and/or urban social work, medical or other students Camps, Shramadan, etc. Leadership in such activities should be considered important.

(iii) Skills such as photography, manual workmanship, knowledge of Electronics, music and all other activities that lead to cultural development.

(iv) Sports and athletics—A sustained interest and creditable performance in one or more of recognised sports.

(v) Wide cultural interests which may be defined in each case.

2.3.8 There should be an attempt to judge these activities together in a composite manner in selecting the student.

2.3.9 A small number not exceeding 10 per cent. may be selected after an interview. These should be from amongst the academic border line.

2.3.10 It was the opinion of another group of members of the Committee that the selection of the students should be based on a comprehensive entrance test as was practised in some colleges in India and abroad.

2.3.11 Some of the members were also of the opinion that interviews would be valuable if properly organised. The Committee therefore felt that free scope should be given for experimentation in the methods of selection of students to the authorities of the institutions concerned.

2.3.12 It was recommended that all the methods adopted for selection of students may be reviewed at the end of the first five year period.

2.4 *Medium of Instruction*

2.4.1 At this stage the Committee felt necessary to think about the medium of instruction in medical colleges. Although it was desirable for the student to acquire knowledge of various languages, including English, if he was to keep abrest of modern scientific development in various countries, the medium of instruction should be the language which is decided upon by the University in the region concerned.

2.5 *Assessment*

2.5.1 The Committee also felt that it was necessary to indicate their mind regarding the important subject of assessment of the student's knowledge or

examination required during the course of his medical studies. It was the unanimous opinion of the members that the written or theoretical part of the examinations should be abolished throughout. It was pointed out that no written or theoretical examinations were required in Germany, Austria and Scandinavian countries for graduate courses. But the Committee felt that it was necessary to devise methods of examination or assessment by way of practical, clinical and *viva voce* tests to be held periodically during the year. This method of assessment, that is, the elimination of written theoretical examination and reorganisation of other types of evaluation would reduce stress on memorisation and increase correspondingly the amount of understanding of the subjects.

2.5.2 About fifty per cent of the credit in final examination should be allotted to the grades gained by him in day to day work. The averaging of these credits should be done in a comprehensive manner.

2.6 *Duration of the Course*

It was the considered opinion of the members that the duration of the medical course throughout India should be $4\frac{1}{2}$ years followed by compulsory internship of one year.

2.7 *Selection of Teachers*

2.7.1 From a note prepared on the selection of teachers which is appended, the Committee felt that the present method of selection of teachers, their qualifications and the conditions of service, require to be modified. The note describes adequately the important points to be considered by authorities in organising the method of selection of teachers for appointment in medical colleges. The Committee endorsed the opinions expressed in the note. There are four types of teachers concerned with medical education at present:

(*a*) Full time teachers in non-clinical subjects

(*b*) Full time teachers in clinical subjects (non-practising)

(*c*) Part time teachers in clinical subjects, and

(*d*) Part time teachers in subjects like Forensic Medicine, Preventive Medicine, Infectious Diseases, Mental Diseases.

The last type of teachers are usually ex-officio members of the teaching staff in virtue of their other appointments such as Police Surgeon, Director of Public Health, etc. The note points out that most universities now realise that clinical subjects like Medicine, Surgery, Midwifery and Gynaecology can be efficiently taught only by a full time staff supported by part time teachers wherever necessary.

2.7.2 Two points have been stressed for the appointment of teachers:

(*a*) Elaboration of a suitable machinery for the recruitment of teachers, and

(*b*) Formulation of the necessary qualifications which should provide a basis for their selection.

2.7.3 (*a*) The present method of selection either by the Surgeon General himself or his equivalent or by the Public Service Commission on which he or his equivalent or his nominee is represented as an expert member does not appear to be technically suited for making selection for appointments which are of a highly specialised nature. A selection committee on the lines of an Electoral College in some foreign universities or composed of one member of

the Public Service Commission with two or more eminent teachers in the subject, for which the appointment is to be made, would probably constitute a more satisfactory selection machinery.

(*b*) Qualifications that require to be carefully looked for, weighed and compared are:

(i) ability to convey knowledge,

(ii) possession of postgraduate attainments, and

(iii) proved ability for carrying out or guiding original work.

2.7.4 The note concludes thus "There are three considerations which should be constantly kept in mind:

(i) Selecting and appointing authorities should enjoy a large measure of flexibility in the manner and sequence of appointments to the staff of the medical colleges.

(ii) Promotion from a lecturer, reader or Assistant Professor to the post of a Professor in the same institution should be discouraged as far as possible. This would prevent inbreeding of ideas and arrangements in any given departments and foster cross fertilisation of concepts and methods.

(iii) Although a permanent tenure of service has many reasons for commending it, it is also unfortunately true that it leads to a feeling that it is sinecure and curtails initiative and incentive to further original work. It is therefore recommended that a system of five years tenure renewable on commendable performance as judged by internationally recognised assessor or a panel of assessors is a matter worth careful consideration."

2.8 *Organisation of Departments*

2.8.1 A functional continuity through integration of teaching of all the departments in a medical college is necessary. This objective should be in minds of members of the department. Structural arrangements should be planned accordingly. It is so in several of pre-clinical departments in most of the newly built medical colleges. This has already led to greater collaboration between the staffs of respective departments. It is essential that it should also obtain between the clinical and pre-clinical departments. In this direction, it is necessary to organise clinical departments in the colleges with a strong nucleus of a full time non-practising staff. It is therefore suggested that each department should consist of a nucleus of permanent staff and a contingent short-term staff at all levels except the head of the department. It is further suggested that in the case of tutors and demonstrators, the proportion of full time to short-term personnel should be 1 to 2. The departments of Medicine, Surgery, Obstetrics and Gynaecology and Anaesthesiology should be so organised as a first step. The charge of these departments would be under a full time professor who will be the Director of the department. The planning, co-ordination, distribution of teachers, maintenance of proper records and follow-up of patients as well as initiation and guidance of research will be the responsibility of the Director. The care and treatment of patients should be suitably distributed between full time and part time teachers. Each department will have attached to it one or more full time members from the departments of Pathology, Radiology, Biochemistry, Pharmacology, and such other specialities as may be deemed necessary.

2.8.2 In the organisation of a college, therefore, in addition to the department of Anatomy, Physiology, Pharmacology and Pathology there will be well organised departments with a nucleus of full time staff in the four subjects mentioned above.

2.9 *Conditions of Service*

One of the main reasons of the considerable disparity in the outlook that is often seen between the staffs of pre-clinical and clinical departments is the fact that qualifications required for and the conditions of service offered are greatly divergent. It is necessary to bridge this gulf and the Committee is of the opinion that there should be no difference between the qualifications required and the conditions of service offered to corresponding members of the staff in all the departments of the college. It was also felt that improvement in teaching and in the work generally will follow if in addition, provision is made for residential accommodation for the whole staff in the compound or in the vicinity of medical institutions.

2.10 *Curriculum and Methods of Teaching*

2.10.1 In the terms of reference to the Committee the curriculum, methods of teaching including integration between different subjects and certain special subjects such as preventive and social medicine, pediatrics, psychiatry, biostatistics and rural field experience have been studied by the Committee. The subjects of the curriculum and the order in which they are being taught is almost uniform in all colleges as they have been suggested by the Indian Medical Council. There is, however, a considerable variation in the time allotted to various subjects. Compartmentalisation of teaching in these subjects is still the rule. Compartmentalisation not only exists in the pre-clinical subjects but more so in the clinical subjects. This leads to:

(*a*) Increase in the time required for satisfactory covering of the course.

(*b*) Considerable repetition of the same topics.

(*c*) Considerable wastage of time which may be utilised much better.

(*d*) Tendency to emphasise the techniques and crafts developed in all subjects.

2.10.2 As the course envisaged in the objectives of medical education has to be differently devised, a complete overhaul and reorganisation is essential. This will apply to:

(*a*) Duration of the course in each subject.

(*b*) Order in which subjects should be covered.

(*c*) The methods of integration between different subjects while teaching.

2.11 *Integration*

2.11.1 From the replies received, it appears that the concept of integration has been difficult to define. The Committee feels that the following may be kept in mind while organising an integrated course:

2.11.2 A student must of necessity 'integrate' in his mind the knowledge he requires in order to obtain a complete idea of a dynamic event. In other words, he has to blend together the information he derives from different disciplines so as to build a composite picture of a biological process in the entire organism living within his environment.

2.11.3 It is obvious that instruction in any subject is closely related with what the student has learnt in the past and is going to learn in the future. It is necessary therefore that his mind be so attuned that he can without effort and somewhat automatically review in his mind related concepts while studying a subject. Physical and biological sciences have, as a result of specialised study, actually come closer together. Medical subjects are an extended application of the knowledge acquired of these basic sciences. The curriculum should therefore be so organised that there is a natural flow without any barrier from one subject to another. Teaching begins by a short period of orientation of students to medical course.

2.11.4 At what stage should the study of structure and function be related is a question bristling with difficulty. Histology or microscopic anatomy forms a bridge between Anatomy, Physiology and Pathology. The courses for the study of these subjects should therefore be devised by close collaboration between the departments of anatomy, physiology and pathology. The subject of pharmacology can best be begun while the students are learning physiology, wherever this could be correlated.

2.11.5 Stray attempts have been made at integration of teaching in various colleges. Considerable difficulties have been encountered and some of them appear to be unsurmountable.

2.11.6 Necessary staff required for achieving the object of removing compartmental barriers and bringing the departments closer together is not available at present in any of the colleges.

2.11.7 It has been suggested by many that in order to arouse greater interest in the pre-clinical subjects, relevent clinical aspects may be introduced in the pre-clinical period. Diseases and their study should not be introduced at this stage. Functions of various organs, co-ordination of different organ systems and deviations from the normal may be valuable exercises, if studied in continuity.

2.11.8 A useful suggestion is made that both pre-clinical and clinical students should meet together in the study of social and environmental conditions of the people in general and as a result mutual interests would be created. This suggestion merits careful study.

2.11.9 It is advisable to leave the initiative of preparing such integrated teaching to the teachers themselves. This can be facilitated by co-ordinating pre-clinical and clinical departments horizontally and vertically, by holding conferences of the teachers in the pre-clinical and clinical departments before the commencement of the year and before the beginning of every new instructional activity, such as lecture-demonstrations, seminars, joint conferences, etc. For this purpose, it would be necessary to have a permanent Committee on Education composed of representation from all the departments.

2.11.10 The recommendations of the Indian Medical Council and of Universities will have to be revised in the matter of rigidity of courses and of the periods of time spent by the students in each department. The Universities should lay down broad policies and encourage their implementation by leaving the initiative to the individual institutions in the manner they think best.

2.11.11 Additional finances would be required for such a reorganisation. This is true, but the returns from this extra outlay would be manifold. The future doctor will be better educated, will have a broader outlook and will consider the preventive and social aspects of his work of prime importance. He will thus become a far more useful citizen in matters of health and care.

2.12 *Lectures*

2.12.1 From the replies received, there is a fairly unanimous opinion that didactic lectures of the type and in the number given at present do not serve very useful purpose. There are exceptions to this. Lectures, which stress the basic facts, their applications, lines of advance in thought, and research, given by capable teachers are valuable and cannot be replaced by text book reading. But these could be only few in each subject. The subjects for lecture should be carefully selected beforehand, properly studied and prepared before being delivered as didactic lectures. The nature of these will be different in different institutions according to the interests and ability of their teachers and should be worked out for each term by the staff after mutual consultations.

2.12.2 During these lectures, audio-visual aids especially slides, charts, models should be selected and used with great care. Too many of these aids in a lecture defeat often the purpose of the lecture and distract the attention of the students from the main theme. It is suggested that only those, that stress vividly a point made, that increase the interest in the subject and that answer questions in a nutshell, should be carefully selected for each lecture. This will require more time and more staff for preparation of material for demonstration. Didactic lectures, therefore, should be revitalised and prepared in such a manner that they supplement the text-books and make their reading easier and more interesting.

2.13 *Lecture-demonstrations*

2.13.1 Lecture-demonstrations are recommended as the main pivot round which teaching should revolve. The classes have necessarily to be small, 10 to 15 students in each. The students should be made to participate actively. This would be possible to the extent they have acquired a preliminary acquaintance with the subject themselves through the literature. These demonstrations will therefore require a carefully prepared programme. The programme will be distributed to the students at the beginning of the term. This will facilitate proper reading before and after the lecture-demonstrations.

2.13.2 Each student should have the guidance of a Preceptor to tutor throughout the course. Not more than 10 to 15 students should be attached to each tutor. This will require provision of a large full time and part time staff (Refer 2.8).

2.14 *Practical Classes*

2.14.1 It is the opinion of many teachers that the practical classes require reorganisation.

2.14.2 The use of human material in the teaching of Physiology should be extended. Animal experiments may be reduced, wherever possible. Reorientation of the functions of these experiments appears to be necessary. What can be demonstrated in the human body itself should not be also required to be worked out on animals.

2.15 *Microscopes*

2.15.1 The use of the microscope is necessary by the students throughout the course. This can be best obtained by students possessing a microscope themselves. Every encouragement should be given to the students to possess

one. Loans, if necessary, may be given by the authorities on easy terms to purchase a microscope. The departments themselves will require less student microscopes thereby and some saving in the capital as well as recurring expenditure will be possible.

2.16 *X-Rays*

It is recommended in nearly all replies that X-Rays should be made use of more freely in teaching human anatomy and physiology. An increase in and a reorganisation of the staff is required for this. A standard X-Ray plant should be a necessary equipment and it should be shared by Anatomy and Physiology departments.

2.17 *Student Seminars*

2.17.1 It has been suggested that some of the lectures can be replaced by student seminars at all stages. It is already being attempted in some places. Small groups are formed first. They prepare the subject in its various aspects and discuss it before their classes or amongst themselves. The teachers present guide the discussion. This should not be overdone but about 6 such seminars in each term of 6 months may be a valuable experience for the students and the teachers alike.

2.17.2 Plenty of scope for flexibility and experimentation should be available to each college department.

2.17.3 It is necessary to maintain a full record of methods used for some years if the experience gained further improvements will be possible. These methods will wean the students from the habit of memorising indiscriminately a vast number of important and unimportant data and inculcate the habit of recognising the grasping basic principles and facts which must be remembered. In fact these will come to them naturally and without effort.

2.18 *Dissections*

2.18.1 The over emphasis on dissections still continues in many colleges. It is also seen from the hours spent on dissection which range from about 300 to over 1000. Some have, however, felt that considerable wastage of time may be prevented if the method of dissection can be simplified so as to expose and recognise main structures. It is felt that in following the Cunningham routine and in trying to dissect and locate the numerous small branches of blood vessels, nerves, lymphatics which many students imagine that they find, but do not do so, the effort involved is not commensurate with the benefits gained.

2.18.2 It is advisable to reduce hours of instruction in several other subjects, as has been suggested for dissection hours.

2.18.3 It is recommended that the number of dissection hours be curtailed and method of dissection studied carefully with a view to its simplification. It may be mentioned here that for post-graduate work in Anatomy and Surgery, more detailed dissections will be required and may be more profitable then.

2.19 *Clinical Clerking*

2.19.1 The objects of this portion of the student's curriculum is to obtain a first hand and direct contact with patients in the ward and the O.P.D. The

student when he has finished the period of clinical clerking should have succeeded in:

(*a*) Getting into a personal relationship with his patient.

(*b*) Understanding mental make up and environmental conditions.

(*c*) Making an intelligent physical examination.

(*d*) Following the progress of the ailment.

(*e*) Arriving at a tentative diagnosis.

(*f*) Thinking out measures, remedial and preventive till rehabilitation.

2.19.2 These can be achieved only if the student has developed a proper attitude and taken individual interest in the patient and if he is properly supervised during his clinical clerkship. One of the most important requirements for the study of the patient is a complete record of what the student has learnt from him during his stay at the hospital and in the follow-up wherever possible.

2.19.3 In preparing this record the student will require guidance from all his teachers as well as from his post-graduate student colleagues.

2.19.4 Unless the record of the student is checked frequently he will not derive the full benefit from it.

2.19.5 The most important factor in the success of clinical clerkship is the personal interest shown by the teachers in the students and by both in the patients.

2.19.6 Besides, clinics should always revolve round the patient. They should not degenerate into didactic lectures. Differential diagnosis should evolve out of the findings of the history and examination of the patient. A catalogue of possible diseases in a seriatim list put before the student will only encourage memorising without the background of well developed associations which are essential for proper study.

2.19.7 Integration between clinical and basic subjects should be practised with advantage wherever feasible with the help of teachers from these subjects. They should be encouraged to consult them for guidance.

2.19.8 Records should be illustrative. Photographs, diagrams etc., should form part of the records. The photographic department of the institution should help and co-operate. Thus, clinical material is not wasted but is permanently recorded on the spot for the benefit of the student and the teacher.

2.20 *Seminars, group conferences, clinicopathological conferences and pathologico-clinical conferences*

2.20.1 These have evolved in the West to their present high pitch of excellence by a process of trial and error. They can succeed best if certain principles are kept in mind:

(*a*) They require co-operation between various members of the staff of different departments.

(*b*) They cannot be worked out satisfactorily unless the majority of the members of the staff are full time and devoted to teaching and research for most of their working time.

(*c*) They require a careful and detailed preparation.

(*d*) They require a high state of departmental technical efficiency in the matter of preparation of material for demonstration at each of the conferences.

2.20.2 As a first step, it is recommended that in the pre-clinical departments:

(*a*) There should be a staff conference in each department every fortnight reviewing the work done during the fortnight and planning the work of the ensuing fortnight. The attendance should be compulsory for all members of the staff. At these meetings, difficulties met with will be discussed and attempts made to solve them so that at subsequent meetings better results are reported.

(*b*) Once a month a staff meeting should be held when a subject will be discussed by all the members. These subjects should relate to work that is being carried out in the department. Relevant literature will be reviewed and progress of work by the members of the staff noted.

(*c*) Student seminars should be organised once a month.

2.20.3 As a result of the atmosphere created by this type of work research mindedness will develop in some members of the staff and students. These members should be encouraged to undertake some original work on their own or in co-operation, during their elective period. Work done in such projects should receive considerable assessment value or even exemptions in grading or promotion of the student.

2.21 *Clinical Subjects*

2.21.1 There is a consensus of opinion that in the teaching of clinical subjects there is ample scope for co-ordination, which would avoid:

(*a*) Repetition in teaching.

(*b*) Undue emphasis in the teaching specialities.

(*c*) Too many didactic lectures.

(*d*) Lack of integration.

2.21.2 It is a common practice to teach methods of history taking and physical examination before actual clinical clerking has begun. It is, however, not uniform. It should be so. A fair amount of normal psychology, social and environmental factors and general methods of approach to the patient, the art of history taking and of physical examination and of maintaining correct and readable records are all essential before commencing clinical clerking. If this is accepted as a necessary and uniform requirement it will go a long way towards a better study of the sick person. It has been stressed in many replies that it is sick person reacting to his socio-economic environment that is being studied and not his disease alone in the hospital.

2.21.3 It is suggested that judicious introduction of seminars and group discussions in the early part of the clinical years would improve considerably observation, expression and record maintenance.

2.21.4 It appears to be necessary that allocation of work should be clearly made between the different members of the staff of the department and responsibility thrown on each. The overall supervision by the head of the department is also absolutely necessary. The formation of independent clinical units in many of the institutions has not been an unmixed advantage. It has led to unplanned division of work, considerable overlapping and excessive repetition. Each department must have a responsible head and all the heads should constitute the panel for co-ordination of teaching.

2.22 *Library*

2.22.1 Library is probably the most important instrument in learning. This, however, requires the proper knowledge of its use. There has been a considerable expansion of libraries in the matter of books and journals but the appointment of well qualified librarians has not kept pace with this expansion. It was largely so in the past because qualified librarians were not available. With a number of Universities taking up the subject of the library seriously and organising a course for the training of librarians the availability of qualified persons will improve and it would be possible for every central library of a medical college to have qualified librarians in charge of it.

2.22.2 The time available for the staff and students for referring to the literature in the library will be outside the teaching hours in the college, hence libraries should be kept open for 15 hours on working days. Arrangements for storing microfilms and microprints in the library and providing apparatus for reading them will also be necessary.

2.23 *Museum*

2.23.1 There is still another aspect of didactic education, *i.e.*, education through the medium of museum. If there is a museum to be worthy being called "a library composed not of books, but of things themselves about which books are written", none can deny the contribution of it in teaching medicine. For practically every subject in medical curriculum there can be appropriate museum since medical subjects deal with concrete things. If there is convenient display of the subjects, which are arranged not only from the point of view of the individual specimens or systems but also from the subject of emphasising their practical importance, much can be imparted through them. It is here that groups system of teaching can be introduced with advantage. It can take either of the two forms. In one, the specimens on different systems can be allotted to different groups of the class. The members of each group are then required to study these exhaustively and to present findings before the teacher. In another method different sets of teachers are allotted different groups of students for whose teaching they are responsible. It is possible and probably feasible to combine the two systems. In the group system where student teacher ratio is not high, information atmosphere and therefore better exchange of ideas can be expected to occur.

2.24 *Post-mortems*

2.24.1 The number of post-mortems available for study is woefully inadequate in all the institutions in the country. In large cities medico-legal post-mortems supplement by more than half the post-mortems from the hospital patients. It is felt by many that the number of post-mortems varies directly with the interest of the staff in obtaining them. This includes the zeal of the hospital authorities in co-operating with the staff.

2.24.2 It is, however, felt that it will be long time before methods of education and persuasion alone succeed in obtaining a larger number.

2.24.3 That some forms of legal sanctions are necessary is the general opinion. This may be in the manner of the Anatomy Acts passed by some State Legislatures. It is necessary to legislate that in teaching hospitals in all cases where the diagnosis has not been established, post-mortems will be required. This may be later extended to all deaths occurring in these institutions.

2.24.4 Of course, it is necessary to realise that such legislation will only be passed if the hospital going public are educated to accept post-mortems as a moral and social obligation in the interest of medical education and public health.

2.25 *Suggested curriculum*

2.25.1 A comprehensive statement has been prepared showing the present arrangement that are operating in medical colleges (see table with explanatory note). It will be noticed that they follow a common pattern although the time devoted to individual subjects varies considerably. This discrepancy is probably due to the fact that some colleges still have a five year course, while many have changed over to $4\frac{1}{2}$ years as recommended by the Indian Medical Council.

2.25.2 Sample curricula are attached as suggested by some of the members, A tentative curriculum hours' distribution has been prepared for consideration and has been attached with two such from universities in U.S.A. It would be seen from these tables that considerable saving on teaching hours is possible in the $4\frac{1}{2}$ years course with time left for electives for the students. These tables also show functional unity of subjects in the pre-clinical years.

2.25.3 In some institutions abroad Pathology, Bacteriology, Parasitology and Basic Pharmacology is taught by giving an intensive course of two terms before starting the clinical subjects. The pace of this course is set by Pathology. This has much to commend it, if it can be organised. On the other hand, there is an equally strong opinion that the subject of Pathology and Bacteriology and Parasitology should be taught concurrently with clinical subjects, throughout the third and fourth years. At present there is considerable discordance between Pharmacology, Pathology and clinical subjects. The latter go faster than the former and the application of basic science of Pathology is often not possible in a rational manner. Memorising is therefore fostered to the detriment of understanding.

2.25.4 An intensive course of the type suggested is in the opinion of some teachers, a fundamental advance and will lead to a more rational and a better co-ordinated study of medicine in future. It is recommended that the teaching of pathology should precede or be correlated with the teaching of clinical subjects so that proper integration between clinical subjects and pathology, bacteriology etc., will be possible.

2.26 *Special subjects*

The Committee was asked to study the role of some of the newer subjects in the curricula. These were :

(*a*) Preventive and Social Medicine.
(*b*) Pediatrics.
(*c*) Psychiatrics.
(*d*) Rural Field Experience.

Special notes were submitted to the Committee on some of these subjects. Notes as submitted or their summaries are appended.

2.26.1 *Preventive and Social Medicine*

That in the new set up of medical education this subject should be dealt with throughout the course was the general opinion. The object of focussing the

attention of the students throughout the course on the positive health, the maintenance of health and prevention of illness throughout the course is to prepare him for a more dynamic role in the course.

The note submitted indicates how an integrated curriculum can be devised for this subject. It is appreciated that difficulties will be experienced in the beginning largely due to want of qualified staff. The staff will have to be adequately trained. It is suggested that priority be given to the programme of training the personnel required for the department of Preventive and Social Medicine.

2.26.2 *Pediatrics*

A summary of the note is appended. The importance of this subject must be reflected in the curriculum. It is recommended to be taught in three stages, (1) the growth and development of the new born, (2) diseases of the new born, and (3) diseases of children. It is recommended that three months should be devoted to this subject, one of which may be an internship period.

2.26.3 *Psychiatry*

The note appended indicates the way in which integration can be achieved. The healthy mind should be discussed while the students are learning physiology and mental health in its various aspects during the other three clinical years. The psychosomatic aspects of the disease should be considered along with and not separately from the clinical.

2.26.4 *Rural Field Experience*

An extensive note has been prepared and appended. The importance of this subject in India cannot be over-estimated. Some form of contract with rural areas should be established even from the first year of the medical course. Some intermingling of junior and senior medical students is desirable at this stage. Organisation of work during such periods of field experience is essential and considerable planning will be necessary before they are undertaken.

2.27 *Internship*

2.27.1 At present after graduation, a fair number of students start their career with a hospital appointment in one of the clinical departments and are designated as a house officer. This appointment usually lasts for six months and may be renewed in another department for six months more. Such appointments are not available to all the students who graduate. The clinical clerking period, although it makes for contact with the patients, gives no responsibility to the students. Internship, which carries with it responsibilities, greater and more personal contact with the patients, is a step forward in the training of the medical students.

2.27.2 The Committee recommends that a rotating internship of a period of 3 months each be required for the students. This would be divided as under:

(*a*) Medicine
(*b*) Field internship (rural or urban) } both compulsory,
(*c*) Any one of the subjects like surgery, obstetrics, and the specialities.

2.27.3 A stipend and a residence are essential for the interns. The internship should be organised under a recognised teacher in a recognised institution. Interns must produce full records of their work. This work should be so organised that the time of interns is adequately and usefully occupied. Considerable preliminary survey of the facilities available will be necessary before the students are actually posted.

2.27.4 Internship is a responsibility of the University as it is a part of the educational requirement. Under no condition must the University part with this responsibility. Before the student has been declared to have finished his internship satisfactorily, full record of work done in each department should be made available to the University. In case of unsatisfactory work or poor attendance, the internship should be required to be repeated. The intern year should be so organised that the student who has finished his examinations, would consider it to be the most valuable year of his medical education.

2.28 *Post-graduate training*

After graduation, it is necessary that the medical man should keep in constant teach with his subject. This can be properly achieved if he is provided with well organised and well integrated courses of a Refresher nature. It should be incumbent on all medical institutions in the country to offer these courses to the regional graduates. This activity at the present moment is being carried out to some extent by various medical associations in the country. It is felt, however, that it is the function primarily of the teaching medical colleges. It is the duty of the State to provide for such facilities as may be necessary to keep their medical men abreast of the recent advances in knowledge. A provision, therefore, of libraries, laboratories, etc., should be made in the district centres so as to serve the needs of medical men stationed in rural areas. Leave, allowances and other conditions of services should be determined after considering these requirements.

2.29 *The future*

2.29.1 "Given a competent faculty, a school must be independent of any domination or coercion in the development of its teaching and research programmes as long as satisfactory standards on medical education are maintained". *Weiskotten*

This enunciates the main principle to be kept constantly in view by medical educationists of the country.

2.29.2 "Either in its Dean, with his faculty or in the faculty itself, the school must have sound, intelligent effective leadership which views the school as an integrated whole in regard to its education and research programmes, its relationship in hospitals and outpatient clinics and to all health and medical programmes of the area in which it is located, as well as its place in the nation as a whole". *Weiskotten*

Further progress in medical education will be possible if the educationists frequently organise an Association of themselves on an All India basis and meet on a common platform.

SECTION III.

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APPENDIX I.

Suggested Curricula

	Anatomy	Physiology	Pharmaco-logy	Pathology	Preventive Medicine	Medicine	Surgery	Obst. and Gynaec.	Elective	Total hours
Pre-clinical (1½ yrs.)	500	500	50	20	160	..	..	..	300	1,530
Clinical (3 yrs.)	..	..	75	450	100	300	150	..	125	1,200
	..	..	50	50	100	300	325	200	175	1,200
	..	..	25	50	30	300	325	200	270	1,200

Pharmacology includes: Toxicology.

Anatomy includes: Embryology. Histology (part).

Physiology includes: Bio-chemistry. Normal Psychology.

Pathology includes: Forensic Medical & Traumatic, Toxicology, Bacteriology and Parasitology. Histology (part).

Medicine includes: Pediatrics. Tuberculosis. Leprosy. Skin & Ven. Part of Radiology Infectious Diseases & Mental Health.

Surgery includes: Opthalmology, Orthopaedic surgery, Anaesthesiology. E.N.T. Surgery, Dentistry, and Radiology (part).

APPENDIX 2.

Statement showing the present arrangement of lectures, demonstrations, etc., operating in certain Medical Colleges

	A	B	C	D	E	F	G	H	I	J	K	L	Total	Average
Anatomy—														
Lectures .	150	169	57	200	330	340	187	170	138	120	66	179	2,106/12	175·5
Lec-demon.	150	170	541	180	136	..	93	136	85	120	122	60	1,793/11	163·0
Dissec. .	800	566	684	700	816	1,020	..	544	1,035	320	400	600	7,485/11	680·4
TOTAL .	1,100	905	1,282	1,080	1,282	1,360	280	850	1,258	560	588	839	11,384/12	948·6
Embryology—														
Lect. . .	30	42(ana)	40(ana)..		Ana.	68	Anat.	30	Anat.	15	Anat.	Anat.	225/6	37·5
Lec-demon.	10	..	..	..	..	..	..	..	..	..	..	..	10/1	10
Pract. .	..	10	..	..	..	..	..	..	..	..	..	..	10/1	10
TOTAL .	40	52	40	..	..	68	..	30	..	15	..	..	245/6	40·8

APPENDIX 2—*contd.*

Statement showing the present arrangement of lectures, demonstrations, etc., operating in certain Medical Colleges—*contd.*

	A	B	C	D	E	F	G	H	I	J	K	L	Total	Average
Histology—														
Lect. . .	Phys.	Phys.	Phys.	12	Phys.	68	Anat.	88	Phys.	Phys.	Anat.	Phys.	168/3	56
Lec-demon. .	..	..	25	40	..	..	..	..	..	..	..	..	65/2	32·5
Pract. . .	100	100	75	50	100	204	..	..	60	60	..	..	749/8	93·6
TOTAL .	100	100	100	102	100	272	..	88	60	60	..	..	982/9	109·1
Physiology—														
Lect. . .	260	197	180	290	150	340	161	204	152	105	112	170	2,321/12	193·4
Lec-demon. .	60	20	230	40	30	..	..	66	80	24	..	40	590/9	65·5
Pract. . .	80	84	100	50	100	204	74	88	60	60	79	30	1,009/12	84·1
TOTAL .	400	301	510	380	280	544	235	358	292	189	191	240	3,920/12	326·6

Bio-Chemistry—														
Lect. . .	Phys.	78	Phys.	40	70	68	Phys.	Phys.	Phys.	60	64	102	482/7	68·8
Lec.-demon	15	..	110	20	..	..	..	..	..	14	..	..	159/4	39·7
Pract. .	80	78	80	50	62	136	..	55	60	60	..	67	728/10	72·8
TOTAL	95	156	190	110	132	204	..	55	60	134	64	169	1,369/11	124·4
Pharmacology—														
Lect. .	150	98	155	80	153	80	100	102	73	60	130	136	1,317/12	109·7
Lec.-demon.	36	15	20	60	51	..	20	34	69	14	..	45	364/10	36·4
Pract. .	134	46	35	90	76	136	48	102	25	60	99	50	901/12	75·1
TOTAL	320	159	210	230	280	216	168	238	167	134	229	231	2,582/12	215·1
Pathology—														
Lec. . .	85	45	88	59	126	136	27	40	90	90	48	120	954/12	79·5
Lec.-demon.	..	..	70	160	68	..	30	25	128	30	..	..	511/7	73
Pract. .	34	104	32	172	110	136	45	100	100	150	72	200	1,255/12	104·6
TOTAL	119	149	190	391	304	272	102	165	318	270	120	320	2,720/12	226·7

APPENDIX 2.—*contd.*

Statement showing the present arrangement of lectures, demonstrations, etc., operating in certain Medical Colleges—*contd.*

	A	B	C	D	E	F	G	H	I	J	K	L	Total	Average
Bacteriology—														
Lec.	35	37	32	33	40 (with path)	..	..	40 (with path)	..	40	42	30	329/9	36·5
Lec.-demon.	..	..	30	36	20	..	..	..	..	..	..	..	86/3	28·6
Pract.	16	54	24	60	20	..	..	100	..	90	72	60	496/9	55·1
TOTAL	51	91	86	129	80	..	..	140	..	130	114	90	911/9	101·2
Parasitology—														
Lec.	25	8	8	18	20 (with path)		30	10 (with path)		15 (with path)		20	154/9	17·1
Lec. demon	..	..	10	40	10	..	..	..	..	..	..	..	60/3	20
Pract.	6	16	8	24	10	..	30	20 (with path)		30	..	40	184/9	20·4
TOTAL	31	24	26	82	40	..	60	30	..	45	..	60	398/9	44·2

Foren. Medicine—

Lec. . .	50	40	50	31	42	34	30	20	61	30	43	50	481/12	40·1
Lec.dem. .	8	..	..	5	8	..	..	..	..	..	..	..	21/3	7
Pract. . .	..	..	..	10	..	..	..	10	27	..	..	25	72/4	18
TOTAL .	58	40	50	46	50	34	30	30	88	30	43	75	574/12	47·8

Toxicology—

TOTAL	.with pharma.	with Foren.	with P.M.	19	with P.M.	34	10	with P.M.	..	with P.M.	34 15(49)	with P.M.	112/4	28

Medicine—

Lec. . .	100	142	173	230	..	269	136	122	152	166	155	312	1,957/11	177·9
Lec.-demon. .	30	..	..	120	..	..	..	..	..	..	150	199	499/4	124·7
Pract. .	89	654	746	945	..	..	630	204	..	808	..	..	4,076/7	582·2
TOTAL .	219	796	919	1,295	..	269	766	326	152	974	305	511	6,532/11	593·8

APPENDIX 2.—*contd.*

Statement showing the present arrangement of lectures, demonstrations, etc., operating in certain Medical Colleges—*contd.*

	A	B	C	D	E	F	G	H	I	J	K	L	Total	Average
Including:														
Pediatrics—														
Lec. . .	20	16	24	10	..	12	20	20	..	24	10	12	168/10	1·68
Pract. . .	62	62	40	..	..	..	62	..	..	62	36	12	336/7	48
T.B.—														
Lec. . .	20	6	13	40	..	12	..	15	..	12	18	14	150/9	16·6
Pract. . .	15	15	30	40	..	..	..	..	..	62	..	14	176/6	29·3
Leprosy—														
Lec. . ..	3	4	10	with skin	..	5	..	..	8	4	7	6	47/8	5·8
Lec.-demon. . ..	..	..	..	..	..	..	..	10	..	..	..	..	10/1	10
Pract.	..	24	..	..	..	..	..	..	..	30	..	12	66/8	22

Skin—																	
Lec. . .	20	8	12	20	..	12	..	..	8	22	(with Lep)	24	126/8	15·7
Lec.-demon. . ..	..	30	40	..	..	..	..	..	62	..	24	156/4	39·0
Mental—														
Lec. . .	18	20	24	10	..	12	16	10	8	24	30	20	192/11	17·4
Lec. demon. .	8	..	..	..	..	..	6	..	..	..	..	..	14/2	7
Pract. . .	8	15	20	25	..	..	..	..	..	30	6	20	124/7	17·7
V.D.—														
Lec.		8	10	with skin	..	12	..	..	8	with skin	6	20	64/6	10·6
Pract	..	..	30	..	..	..	..	..	..	..	..	..	30/1	30
Inf. diseases—														
Lect. . .	.with	12	12	10	6	12	..	15	..	12	12	12	103/9	11·4
Pract. .	prev. . ..	30	24	40	..	..	..	..	..	..	..	12	106/4	26·5
TOTAL . ..		42	36	50	6	12	..	15	..	12	12	24	209/9	23·2

APPENDIX 2.—*contd.*

Statement showing the present arrangement of lectures, demonstrations, etc., operating in certain Medical Colleges—*contd.*

	A	B	C	D	E	F	G	H	I	J	K	L	Total	Average
Prev. Medicine—														
Lec.	42	50	97	60	116	136	..	45	60	50	50	75	781/11	71·0
Lec.-demon.	20	12			41	..	..	180	10	..	..	..	263/5	52·6
Pract.	..	..	..	30	33	102	..	20	..	..	10	15	210/6	35·0
TOTAL	62	62	97	90	190	238	..	245	70	50	60	90	1,254/11	114·0
Surgery—														
Lec.	150	138	135	180	..	228	139	238	128	122	172	200	1,830/11	166·3
Lec.-demon.	..	..	..	120	..	..	..	..	..	..	200	40	360/3	120
Pract.	560	622	622	600	..	..	607	649	..	629	..	..	4,289/7	612·7
TOTAL	710	760	757	900	..	228	746	887	128	751	372	240	6,479/11	589

Including :

Anaesthesia—															
Lec. . .	14	12	12	10	7	12	12	..	8	12	12	10	121/11	11·0
Lec.-demon.	..	..	..	..	..	..	..	..	..	..	20	5	25/2	12.5
Pract. .	10	..	30	10	..	..	..	..	..	..	..	..	50/3	16·6
TOTAL	24	12	42	20	7	12	12	..	8	12	32	15	196/11	17·8
Orthopaedics—															
Lec. . .	25	16	13	..	..	12	12	37	..	15	20	10	160/8	17·7
Lec.-demon.	4	..	..	..	..	..	..	..	..	..	..	..	4/1	4
Pract. .	..	62	30	..	100	..	45	..	..	62	30	6	335/7	47·8
TOTAL	29	78	43	..	100	12	57	37	..	77	50	16	499/10	49·9
Radiology—															
Lec. . .	37	16	12	10	..	12	12	10	10	10	16	15	160/11	14·5
Pract. .	..	30	30	40	..	..	..	..	..	62	20	10	192/6	32·0
TOTAL	37	46	42	50	..	12	12	10	10	72	36	25	352/11	32·0

APPENDIX 2—*concld.*

Statement showing the present arrangement of lectures, demonstrations, etc., operating in certain Medical Colleges—*concld.*

	A	B	C	D	E	F	G	H	I	J	K	L	Total	Average
Obst. & Gynaec—														
Lec. .	100	65	80	130	68	136	60	170	110	60	60	162	1,201/12	100·1
Lec.-demon. .	75	...	..	..	..	..	..	68	..	..	..	20	163/3	54·3
Pract. . .	175	373	375	320	..	..	375	300	..	375	120	..	2,413/8	301·6
TOTAL .	350	438	455	450	68	136	435	538	110	435	180	182	3,777/12	314·7
Oph. & E.N.T.—														
Lec. . .	50	32	41	70	..	80	39	34	35	41	40	90	552/11	50·1
Lec.-demon. .	25	..	..	30	..	..	..	..	..	..	..	..	55/2	27·5
Pract. . .	250	124	92	290	..	..	219	168	..	124	60	35	1,362/9	151·3
TOTAL .	325	156	133	390	..	80	258	202	35	165	100	125	1,969/11	179

Dental—

Lec.	..	12	16	..	..	..	..	..	..	..	..	..	28/2	14
Pract.	..	30	30	..	..	..	..	..	..	..	..	..	60/2	30
TOTAL	..	42	46	..	..	..	..	..	..	..	..	..	88/2	44

Nursing Pract. 63

NOTE.—A questionnaire was sent to all the medical colleges of India in May 1955. Replies were received from 23 colleges of which the responses of 12 gave sufficiently detailed data on present curriculum hours to permit analysis. For preparing the attached table the following specifics were taken into account.

1. Because the questionnaire answers were sometimes given in hours per week, per term, per year or per course it was necessary to calculate totals on a uniform basis. The following approximate figures were accepted:

for one hour per week	5½ hours.
hours per practical	2 ,,
weeks per year	34
Tenure per year	2

2. Because of incomplete data averages were calculated only on the basis of the number of responses. These are indicated in the total column.

3. Under the heading of total medicine and total surgery the specialities indicated below are also included The hours given re-present a totalling of all of the speciality hours with the general ones.

APPENDIX 3

Curriculum hours distribution in 2 Universities in U.S.A.

	Anatomy	Physiology	Pharma-cology	Pathology	Preventive medicine	Medicine	Surgery	Obst. and Gynaec.	Elective	Total
Stanford School of Medicine, California.										
1st year . .	770	374	..	..	..	..	..	..	..	1,144
2nd year . .	..	308	187	253	33	231	80	33	..	1,125
3rd year . .	..	..	15	33	..	716	450	214	..	1,428
4th year . .	..	..	..	33	110	577	319	137	100	1,276
										4,973
Havard University, U. S. A.										
1st year . .	180	792	..	..	..	10	..	..	..	1,082
2nd year . .	..	..	160	657	..	112	..	12	..	941
3rd year . .	..	..	..	12	135	401	286	188	..	1,152
4th year . .	..	..	..	..	..	576	188	144	144	1,152
										4,327

Physiology includes : Bio-chemistry Histology.

Pathology includes : Lacteriology Lab. diagnosis Legal medicine.

Medicine includes : Pediatrics Dermatology NeuroPhys. Neurology Psychiatrics Phys. diagnosis.

Surgery includes : Radiology G. U. Surgery Opthalmology Laryngology Otology Orthopaedic surgery.

Preventive Medicine includes : Public Health.

APPENDIX 4

THE FIELD INTERNSHIP

By

Dr. Carl E. Taylor, M.D., F.R.C.P.M.P.H. Dept. of Prev. Medicine, Christian Medical College, Ludhiana, Punjab.

The world wide acceptance of the need for an internship is one of the most encouraging developments in medical education. The medical colleges and hospitals of many countries have for years encouraged doctors to spend a post-graduate period of one or more years in hospital training. In the last 10 to 15 years, however, more and more countries have been making an internship compulsory before a doctor can enter practice. In England this was done in 1944 and medical colleges were given the responsibility of approving and supervising the hospital training. Somewhat similar regulations have been passed in France, Germany and elsewhere.

In India, the recognition of the need for an internship has led to the revised Indian Medical Council recommendations which require a period of 6-12 months of post-graduate training. The unique feature of the internship requirement in India is that there is included a 2-3 months period of field or rural training. As far as I have been to determine India is a pioneer in setting up this type of programme and it is particularly fitting that this be so because of the particular health needs of the country.

No medical college has yet been able to start an adequate field internship programme. It is particularly important at this stage therefore to carefully think through the implications of this regulation in terms of (1) Basic principles involved in internship training, (2) Application of these basic principles to the field internship with particular attention to what the young doctors get out of this experience, (3) the cost in terms of money and personnel which should be planned for to make the programme effective.

1. *Basic principles of a good internship*

A. Practical experience:—

The Planning Committee of the Royal College of Physicians in discussing the need for an internship said that it should give (1) vocational training as contrasted to the more academic training provided in medical school. Vocational techniques and skills of a trade. The emphasis is on learning through doing.

B. Need for constant and careful supervision.

1. Human progress occurs because each generation learns from its predecessors. If every man always had to start from the same point and make the same mistakes in learning the same things civilisation would never develop. It is particularly true in science that we learn most of what we know and use from others, there is very little really we find out for ourselves. In Medicine trial and error is so costly

in terms of human life and suffering that there is constant pressure to make practice uniform and techniques standardised. The main protection a good doctor has from the charge of malpractice is that he is using the same methods that all of his colleagues use.

This does not mean that medicine becomes rigid because we learn from our predecessors and colleagues. On the contrary, it is those who have learned best the usual who are in a position to recognise the unusual and thus improve methodology and knowledge.

2. Even more important than learning the science of medicine in the internship is the chance that the young doctor has to learn the art of medicine. The distinction is important. The science of medicine includes all of the objective knowledge which can be counted, measured and experimented with, the data that can be put in tables and graphs so as to be readily transmitted to other members of the profession. The art of medicine includes the subjective or quantitative refinements of how to handle a patient or discriminate between two diastolic murmurs. It develops usually as a result of experience and probably represents an accumulation of impressions in the subconscious which certain combinations of clinical or other findings bring to the conscious surface of the mind. This art of medicine is particularly important in a doctor's relations with his patients since it includes all of the little habits and interpersonal interactions which determine whether the patient will have respect for a confidence in the doctor. This is seen best perhaps in pediatrics and a simple test is whether the doctor can examine little children without making them afraid. Learning this art comes partly from the individual doctor's own background, experience and personality. Just as important however, is the learning by imitation which was so much a part of the old preceptorship training. The technique of keeping a child happy while examining him by giving him a stethoscope or tongue depressor to play with and other simple manoeuvers are picked up and passed on from one generation of doctors to the next by medical students carefully observing their clinical teachers on the ward. The prevalence of this type of imitation is shown best by the frequent observation that some idiosyncracy of a favourite professor of medicine or surgery becomes characteristic of a whole generation of students influenced by him. In learning arts of paintings or music students devote much of their time in training to the difficult intellectual exercise of trying to analyse what makes certain paintings or musical presentations successful. Then consciously and unconsciously they copy the masters.

3. A doctor just out of medical school is laying the habit patterns which will control his whole professional life. The habits learned in the few months when he first has direct responsibility for patients are the ones which will often times determine the kind of doctor he is going to be. Will he learn to habitually cover all the essential points in a medical history and physical examination, will he learn sterile and efficient techniques in surgery even down to such seeming trifles as the best way to tie a knot or do a veinpuncture ?

Constant and careful supervision means that there should be experienced doctors available to check on the intern's work habits before they become bad, to correct errors, to pick up things omitted, and to give the encouragement which is so often necessary at this formative

stage. This can be done best if hospitals selected for training are under the supervision of the medical college which has provided the rest of the young doctor's training. If all the graduates cannot be accommodated in the medical colleges' own hospitals and health centres the selection and inspection of approved hospitals and field units should certainly be the responsibility of the medical college. Perhaps the best arrangement would be to have joint boards of inspection for certain areas.

C. Requirements of a going organisation with the basic staff and set-up.

The intern should be trained under conditions which are as nearly ideal as possible. He should learn the best ways of doing things which involves good auxiliary staff such as nurses and technicians and adequate equipment. It is a mistake to think that the man who has always struggled with the handicap of defective equipment and help will adapt better to a lack of these things than a man who has been used to the best. If a doctor doesn't know about instruments needed for a specific job the chances are he won't even attempt it. A doctor who has used the instruments and understands their principles of operation is in a far better position to adapt another instrument or make shift a substitute that will work. He will not only try but will more probably succeed in doing jobs requiring adaption.

Although it is important that the young doctor becomes familiar with the best it is also desirable that he be placed into situations where he learns to adapt to less desirable conditions. This leads to a consideration of the field internship, which should come near the end of the hospital internship if this is at all possible.

2. *Objectives of Field Training.*

A. Learning to adapt to conditions of general practice.

Having learned how to handle medical problems under the relatively ideal set-up of a teaching hospital, the young doctor should be made aware of the facts of life which in this instance are that most practicing physicians have to work with limited facilities. He should learn to rely on his own senses for physical diagnosis rather than being lost without the laboratory or X-Ray. In a rural dispensary, he quickly acquires this experience. A certain amount of independence at this stage is desirable to encourage his self reliance. It is, however, just as essential as in the hospital that the intern in the rural centre have expert help available for consultation and for checking up on what he has done.

If we want to attract young doctors to rural service we must make their rural experience attractive. If the doctor has a discouraging experience at this stage all past and future propaganda will be wasted in trying to get him to serve village people. Nothing will be a better recruiting measure for village work than a happy and professionally stimulating rural field training. Some of the essential features are:—

1. Proper accommodation and food.
2. Proper supervision to make it an educational experience.
3. Help and encouragement when needed so that the young doctor won't become disheartened by early failures.
4. An opportunity to gain practical experience in disease prevention and to learn to appreciate the importance of socio-economic causes of disease.

B. Family Medicine—home calls.

One activity that the intern should certainly carry out during his field experience is family visiting. The relationship of the doctor to the family on a home call is one which he should learn to treasure rather than object to because it is time consuming. He should learn to recognise the leads and clues to the diagnosis and understanding of the whole patient which can be picked up by looking around a room or house. A patient seen in his home environment is often a very different person from a medically similar case seen in a hospital bed or on the examining table of an outpatient clinic. A real understanding of psychosomatic factors often can be achieved by observing his relations to the rest of the family.

The easiest way to encourage family visiting would be to organise it from an established dispensary. People would soon learn that they can call a doctor for a home call. On night calls the real facts of family living can be observed.

If a home care programme has not yet been developed sufficiently some other means of getting interns into the homes should be used. A simple method would be to have them do house to house visiting to conduct some specific investigation. This would also give them an introduction to research. They could do a case-finding survey of such things as trachoma, leprosy, tuberculosis, nutritional deficiencies or any other disease of local interest. Whatever the mechanism used I consider home visiting to be the greatest contribution of field training.

C. Preventive Clinics.

Home visiting, while having the advantages both of being an excellent way of teaching the doctor and of being convenient for the patient, has the limitation that the number of families served is necessarily limited. In most preventive medical work, it is necessary to reach as large a segment of the population as possible and for the convenience of health workers groups of people are gathered together in clinics. The field intern should have opportunity to work in and become familiar with the techniques of a variety of clinics. Prenatal and post-natal clinics are probably the basic ones. Pediatric clinics specially those for well babies are important. There should be opportunity to assist in a school health programme, particularly in examining the children. V.D. & T.B. clinics are usually so specialised that experience in these fields is perhaps better given as part of the outpatient experience in the hospital.

The intern should be given first hand opportunities to learn some of the mass methods of handling health problems which have been considered the responsibility of the health officer but which often can be better carried out by the practising physician. Some of these activities are:—

1. *Health education.*—The person that patients and their families pay most attention to is their own doctor. What he says carries more educational weight than stacks of public health pamphlets and posters. Interns should be required to give health talks to groups of school children, to village men and women. They should learn how to use some of the simple audio-visual aids. The main reason most doctors do not do health education and shy away from their civic responsibility of giving talks on health is that they are afraid to. They are not really too busy, they just don't know now. Or even worse they are not good speakers and are not asked because people don't like

to listen to them. The field internship is a good place to give practice and training in the fine art of public speaking, so that the doctors can later on appear before the public with poise

2. *Sanitation.*—While this is mainly the job of health departments and sanitary inspectors the young doctor should have sufficient practical experience in simple sanitation to learn basic principles. This does not mean that he should waste time on the complicated sanitary devices which now occupy so much time in hygiene courses. His efforts should be directed to fundamental understanding of such things as what makes a water supply safe and a latrine unsafe. He should learn techniques of insect control. One reason for this is to try to prevent what too often happens now—the doctor calls in a home for weeks to treat a case of typhoid without bothering to ask about the water supply or latrine arrangements. He not only does nothing about preventing spread to other members of the family but he may even accept a drink himself from a pump which could be the source of infection. Helping to build a latrine or repair a pump should make him latrine and pump conscious in the future.

3. *Inoculation or vaccinated programme.*—If an epidemic breaks out the first ones to respond to the emergency should be the local physicians. Doctors usually work themselves to exhaustion in caring for cases in an epidemic when they might have made a more significant contribution by applying appropriate preventive measures. They should have had practical experience in setting up teams to carry out procedures of mass immunisation in an approved fashion. The lack of sterility and makeshift compromising that we sometimes see is often as much due to ignorance of better methods as anything else.

4. *Nutrition.*—One doesn't have to stress the importance of diet in health and disease to the average Indian villager. Spontaneously they ask what is "Parhez". In a field internship there should be opportunity to learn about diets both common and special. Nutritional surveys are a usual way of teaching about food habits and their importance.

5. *Disease reporting and vital statistics.*—If India is going to obtain creditable vital statistics it will only be through the co-operation of the medical profession. In their field internships doctors should learn the important contribution of vital statistics to an understanding of the health pattern of an organised health centre area. They should recognise the value of good disease reporting in identifying and checking potential epidemics. Then in their practice they will tend to co-operate with government departments in furnishing the raw material of vital statistics.

6. *Co-operation with and utilisation of community resources.*—Much of a busy doctor's professional life is taken up with working with other people. He often learns through the hard method of trial, error and chance how to get along with police and politicians and what special organisations there are available to help his patients. A good health centre mobilises all available community resources and co-ordinate them in an integrated programme. By working in such a centre the young doctor should learn what help is available and how it can be used. Of similar significance is the chance it gives the young doctor to learn the knack of working as a member of a health team.

D. Research.

The field internship is not long enough to undertake major research work. Small projects such as the surveys already mentioned should be encouraged or successive groups of interns could carry out more ambitious joint programmes. These might lead to more intensive work later.

3. *Setting up a Field Training Programme.*

The fundamental organisational unit on which the whole programme can be most efficiently based is the health centre. In some places it may be possible to have a small rural hospital which can serve as the base for a field training programme. Such a programme is planned at Vellore, where Drs. Paul Brand and LeRoy Allen are setting up a small rural style hospital in which only simple and makeshipt equipment will be used. Health activities will radiate out from this base to a group of adjacent villages. There are advantages in such a system but there is also a danger. The field internship should not deteriorate into a period of working in a kucha hospital. The objectives which have been outlined should be kept foremost in both planning and execution. The intern must get out into the homes and village clinics. This is his main job.

The organisation of a health centre has now become fairly standardised as a result of years of experiment at places such as the Rockefeller Model Centres at Singur, Poonammalee, Ramanagaram, and Najafgarh. Basic philosophy and approach have been worked out in reserch centres such as Peckham in London.

As preventive medicine teaching in the medical colleges of India develops each college will presumably have Health Centres for their undergraduate teaching. The addition of intern training to the health centre programme will greatly increase the scope of activities and potentialities of these centres. Since the health centres will presumably be under the direction of the department of preventive and social medicine it would be logical to put the field internships under that department also.

Some States such as Mysore and Bengal have ambitious programmes of providing primary and secondary health centres to cover the entire population of the state in accordance with Bhore Committee recommendations. It may be possible to use state health centres for intern training. The previously stated principle holds here too that the selection and inspecting of the approved health centres should be the responsibility of the department of preventive and social medicine of the medical college concerned.

A. *Basic staff for Health Centre.*

1. *Doctor.*—The man-in-charge should logically be a doctor with a background in both curative and preventive medicine. He should be recognised as a very important member of the teaching staff.
2. *Public Health Nurses or Health Visitors.*—Close communication between the health centre and the homes of the area depends mainly on these workers. They work with the women in helping them to meet the health needs of the home. Priority is naturally given to maternal and child health work but the programme should be expanded to general home care and health education. When field training becomes a part of nurses training co-ordination with the nurses training schools which are part of most medical centres will

naturally be necessary. The number will depend on the area and population covered.

3. *Community health organisers or sanitarians.*—While the public health nurse is working in the home we need men who will take care of the many health problems outside the home. Sanitation and communicable disease control will be their most important job for several years. Their whole approach and training should be that of health educators.

4. Compounders, laboratory technicians and auxiliary staff as required.

B. *Building*—the minimum essentials are:

1. Dispensary with doctor's examining room and drug room.
2. Clinic room for pre-natal and other clnics and organised health education activities.
3. Office space for staff.
4. Residential quarters for resident staff and for interns.
5. Vehicle for transportation to base.

C. *Programme.*

The concept that a health centre should combine preventive and curative activities has gained wide acceptance. Curative work is done for two reasons. The first health need of any community is to have existing illnesses treated. This is the main "felt need" of the people. Secondly, it provides both initial contact and a means of developing close relationship between the centre and the people so that other activities can be readily carried out.

Curative activities are usually restricted to dispensary or out-patient care. Not infrequently a small inpatient maternity centre is also established to take care of obstetrical cases which are too complicated for home delivery or where home conditions are not suitable. In programmes such as that proposed at Vellore a complete rural hospital may be set up. The intern will naturally participate in these curative activities. The type of cases seen and their attitude to those caring for them will approximate the conditions of office practice much more closely than what the intern will have encountered in the larger hospital wards or even the out-patient department. Not more than half of the intern's time should logically be devoted to this type of work, for instance, he could work in the dispensary most mornings. The possibility of periodic visits to branch dispensaries in outlaying villages may make it possible to reach a larger population.

At least the other half of the intern's time should be devoted to preventive work. The specific types of activities have already been outlined. The important consideration is to get them actually out in the field. The intern should complete his period of training in good physical condition because of all the hiking and bicycling which he has been required to do.

The organisation of the programme in terms of number of interns at a health centre and the area and population that they will be expected to cover has yet to be determined. A large health centre covering a large population in several villages could conceivably take 10 interns. If they come in rotation for 3 months of their one year internship this would mean that 40 interns could be

trained each year. Two such centres, perhaps a rural and an urban one, could thus take care of a class of 80, spending half time in each. It is important not to crowd large numbers of interns into a place where there is not enough to do. The field internship should have some of the atmosphere of a vacation in the country but it should be a hard working vacation.

(Reference: 1. Campbell D. Is an intern year necessary? Proc. of First World Conference on Medical Education, London, 1953. Ox. U. Press, 1954.)

APPENDIX 5

Syllabus prepared by Dr. Carl E. Taylor, Prof. of Preventive Medicine at Christian Medical College, Ludhiana (on request of teachers of preventive and social medicines at a Conference held in Delhi, March 21-23, 1955).

The transition from the teaching of Hygiene to teaching Preventive and Social medicine requires considerable reorientation of thinking and planning in medical education. The need for this change has received general acceptance. It is also agreed that to meet the distinctive health needs of India preventive medicine teaching, will have to be specifically adapted to local situations. It will not be sufficient to merely transplant the newly developed specialities of "preventive medicine" from America or "social medicine" from Europe. Basic philosophy and specific techniques must be developed and expanded to meet the much greater needs of India. Course content will have to be largely revised to concentrate on the basic problems of environmental sanitation, communicable diseases, maternal and child health, and nutrition.

In view of the unsettled state of thinking and diverse experience in the teaching of preventive medicine it was most impressive that when those actually doing the job in India had a chance to talk the matter through at the Delhi Conference practical unanimity was readily achieved. The varied developments and experiments in teaching methods and course content seemed to draw together very quickly into a generally accepted pattern which is presented here as a unified curriculum.

A basic consideration throughout the Delhi Conference was the need for integrating teaching with other departments. Many specific situations in which this could be achieved were discussed and examples given. It was also felt that there is a body of knowledge and methodology which can be presented best through specific courses which be presented first.

Summary of curriculum:

I.	Preclinical period:	1½ years.
	A. Human Ecology	20-30 hours
	B. Clinical Conferences	10-20 „
	C. Biostatistics	20-30 „
	D. Field Surveys	10 „
II.	Clinical period:	3 years.
	A. Environmental Hygiene	15-20 hours
	B. Epidemiology (including applied Statistics).	20-30 „
	C. Community Organisation and P. H. Administration	25-30 „

III. *Field Experience*—starting either in 2nd or 3rd year:
A. Family adviser or family doctor plan with rural work projects.
B. Co-ordinated outpatient Department service.

IV. *Integrated teaching* with other departments of medical college. The goal would be integration of preventive concepts in all phases of curriculm but the following offer special opportunities and deserve special emphasis:

A *Preclinical:*	*B Clinical:*
Genetics.	Mental Health.
Nutrition.	Maternal Health.
Medical History.	Child Health.
Demography.	Communicable Diseases.
Child Growth & Development.	Nutrition.
	Parasitology.
	Field Laboratory Methods.

I. *Preclinical Period:* 1½ years.

A. *Human Ecology.* 20-30 hours.

1. *Objectives:*

(*a*) To give broad understanding of man as host in relation to his enviroment (physical, biological & social).

(*b*) To bridge gap between students previous experience and present introduction to medical science.

(*c*) To induce the habit of thinking in terms of multiple causative sequences and the doctor's obligation to attack disease as early as possible in its pattern of development (Levels of prevention).

2. *Course Content:*

(*a*) Definitions and purposes.

(*b*) Populations and their growth—biological or logistic growth curves: Pearl's experiments on fiies in bottles showing factors limiting population growth such as food and space, application to animal populations and human population, influence of disease in population balance.

(*c*) Ecological Adaptation: The host's ability to meet Environmental conditions. Individual through somatic changes and individual adjustments. Group through social developments, for example, preventive medicine is really group adaptation to meet health needs. History of growth of understanding of disease causation:

(1) Supernatural causes.

(2) Physical causes—Greeks.

(3) Biological—bacteriological era.

(4) Social—present.

(5) Ecological—future.

(*d*) Host factors: Inherent, such as genetics, sex, age, race etc. Acquired, such as modifications in growth and development.

(*e*) Physical Environment: Primary need for space, health implications of variations in temperature, water, altitude, sound, light, atmosphere. Class discussion of problems such as experiments necessary to demonstrate why a room gets stuffy.

(*f*) Biological Environment.

1. Nutritional factors.

2. Microbiological agents with beneficial effects contrasted with those which cause disease.
Parasitization and symbiosis.
Host-Agent—Environment as basic trilogy of epidemiology.
Various types of disease agents.

(*g*) Social environment: Interdependence of individuals. Culture concept with learning depending on social patterns. Family as primary social unit. Progressive complexity of social organisation. Universal social needs. Law of cultural growth. Law of cultural lag. Adaptive society *vs.* established society. Social responsibility for health of individual and group.

3. *Suggested References :*

1. Dutta, Medicine and Our Social Welfare, Thacker Spink Calcutta, 1953.
2. Davis, Population of India and Pakistan, Princepton University Press, Princepton, 1951.
3. Hawley, Human Ecology, Ronald Press, New York, 1950.
4. Allen, Emerson, Park, Schmidt, Principles of Animal Ecology, Saunders, Phil. & London, 1949.
5. Pearl, Studies in Human Biology, Williams & Wilkins, Baltimore, 1924.
6. Chase, Proper Study of Mankind, Harper, New York, 1948.
7. Meat *et al,* Cultural Patterns & Technical Change, UNESCO, Paris, 1953.

B. *Clinical Conferences.* 10-20 hours.

1. *Objectives :*

(*a*) To give integrated picture of place of each preclinical science and speciality in understanding disease.

(*b*) Through specific cases to get students into habit of thinking in terms of multiple causation and looking for best chance of prevention.

(*c*) To let students see patients at start of course thus stimulating them to greater attempts to learn well the basic sciences because they understand how these facts contribute to their study of patients.

(*d*) To educate other members of faculty in preventive medicine

2. *Course Content :*

Cases selected to illustrate social origins of disease are presented before first and second year classes by a senior medical student. Then 15-30 minutes are given to each department in order to present the contributions of their speciality in understanding the patient's condition. The department of Preventive medicine gives the final analysis of the

chain of causation showing points where this chain could have been broken and the disease prevented. These conferences are held once a month through first and second years.

C. *Quantitative Methodology (Biostatistics).* 20-30 hours.

1. *Objectives :*

(*a*) To give an understanding of the scientific method and the importance of quantitation.

(*b*) To give practical experience in handling biological data.

2. *Course Content :*

(*a*) 5 steps of scientific method:

1. Stating problem.
2. Discovering what is already known.
3. Evaluating resources.
4. Collecting data with adequate controls.
5. Analysing results and follow-up.

(*b*) Importance of controls.

(*c*) Sampling theory.

(*d*) Types of data usually collected in medicine and public health ; laboratory, clinical, health surveys and special epidemiological studies, routine vital statistical reporting, census.

(*e*) Analysis of data:

1. Single figure to represent mass of biological data—mean, median, mode.
2. Methods of measuring scatter of deviation from that figure—range, quartiles, standard deviation, standard error, other significance tests, normal and skewed curves.
3. Binomial theorem and related tests.
4. Correlations.

(*f*) Rares and Ratios—birth, death, infant and maternal, mortality, incidence, prevalence etc.

3. *Suggested References :*

1. Hill, Principles of Medical Statistics, R. & R. Clark, Edinburgh, 1939.
2. Edge, Vital Statistics in the Tropics, Williams and Wilkins, Baltimore, 1944.
3. Gopalaswami, Census of India. 1951, Govt. of India Press, Delhi, 1953.
4. Muench, Vital Statistics Chap. 3 in Smillie, Preventive Medicine and Public Health, Macmillan, New York, 2nd edition, 1952.
5. Badger, Biostatistics in Leavell and Clark, Text Book of Preventive Medicine, McGraw-Hill, New York, 1953.
6. Dublin and Lotka, The Money Value of a Man, Ronald, New York, 2nd Edition, 1946.
7. W.H.O. Expert Committee on Health Statistics, Reports Nos. 5, 25 and 53, W.H.O., Geneva.

D. *Field Surveys.* 10 hours.

1. *Objectives :*

(*a*) To give students opportunity for first hand acquaintance with village conditions.

(*b*) To give practical experience in biostatistics:

1. The actual collection of data in the field.
2. The analysis of this data as the practical laboratory work of the biostatistics course.

2. *Course Content :*

(*a*) A selected population, preferably, in a rural health centre area, is prepared for the survey by enlisting the co-operation through their panchayat or responsible leaders.

(*b*) Survey forms are prepared dealing with housing, sanitation, socio-economic data, nutrition census data, attitudes, medical history etc.

(*c*) A minimum of three full mornings are arranged when the whole class can go in teams to their allotted families, making the preliminary contacts and proceeding to collect data.

(*d*) In practical laboratory periods of the biostatistics course students are given opportunity to manipulate statistically the data they have collected.

3. *Suggested References :*

1. Lal and Seal, General Health Survey, Singur Health Centre, 1944, Government of India Press, Calcutta, 1949.

2. Patwardhan and Ranganathan, The Nutritive Value of Indian Foods, (Aykroyd) 4th edition. Health Bulletin No. 23, Government of India Press, Simla, 1951.

3. Mitra, *et al,* Note on Management and Technique of Diet Surveys in India, Special Report 21, I.C.M.R. New Delhi, 1951.

II. *Clinical Period :* 3 years.

A. *Environmental Hygiene.* 15-20 hours.

1. *Objectives :*

(*a*) To give an understanding of principles of controlling the physical and biological environment in order to promote health.

(*b*) Description of simple sanitary methods adapted to Indian conditions.

(*c*) Opportunity to see in operation or participate in building certain basic sanitary installations.

2. *Course Content :*

(*a*) Water—properties and dangers, source of supply and sanitary method of obtaining, purification and distribution.

(*b*) Food—sources and methods of preparation, dangers of contamination and their prevention, food handlers, public eating places.

(*c*) Refuse and excreta disposal—relation to spread of disease, urban and rural problems, types of latrines, sewage disposal plants, conservancy and composting, drainage, disposal of dead.

(*d*) Insect Vectors—life cycle of various types, methods of control, insecticides.

(*e*) Housing and ventillation—general principles of town planning, urban and village sites, community plots, recreation areas, community sanitary facilities, types of houses and building material, ventilating systems, heat control, light, smokeless chulas.

(*f*) Control measures for infectious diseases—protozoal, helminthic, bacterial and viral agents, disinfection and sterilisation of houses, wells, articles exposed to patients, discharges from patients, physical and chemical methods.

(*g*) Visits and practical demonstrations of each of above items are more important than didactic teaching about them. Students should be given opportunities in their field work to participate in the building of latrines, soakage pits and smokeless chulas.

3. *Suggested References :*

1. Phelps Public Health Enginering, Vol. I and II, John Wiley, New York, 1948.

2. Ghosh, Public Health & Hygiene, Scientific Publishing Co., Calcutta, 1935.

3. Government of M.P. Series:

a. Water supply in villages.
b. Safe disposal of human excreta-septic tank.
c. Safe disposal of human excreta-sanitary privy.
d. Manual of Water Works Maintenance.
e. Well construction and Sanitary Protection.
M.P. Govt. Printing, Nagpur, 1952, 1953.

4. Williams, Rural Home Sanitation, Ushagram School Press, Asansol, 1939.

5. MacDonald, Small Sewage Disposal system, Lewis, London, or H. & C. Press. Colombo, 1951.

6. W.H.O. Design and Operation of Septic Tanks, Monograph series No. 18, W.H.O., Geneva, 1053.

7. W.H.O. Expert Committee on Sanitation, Report No. 10, 47, 77, W.H.O., Geneva.

8. U.S. Public Health Service, Individual Sewage Disposal Systems, Public Health Rep., Wash, Reprint 2461, 1947.

B. *Epidemiology.*

1. *Objectives :*

(*a*) To give understanding of basic principles controlling mass disease in man.

(*b*) The relationship of disease in the individual to disease in populations.

(*c*) Starting with the epidemiology of communicable diseases to show how same pattern of analysis applies to non-communicable diseases such as cancer and diabetes and to an epidemiology of health.

(*d*) The use of applied vital statistics as a tool of epidemiological analysis.

2. *Course Content :*

(*a*) Epidemiology is the diagnostic discipline of public health dealing with definition of factors controlling spread of disease in populations.

(*b*) Host—agent—environment.

(*c*) Parasitism and Disease. The ecologic equilibrium between host populations and their parasites.

(*d*) Multiple causation of disease, chain of factors leading to overt conditions. Similar epidemics may be caused by widely different causes—importance of balance between host and environment with change on either side giving agent a chance to spread.

(*e*) Pattern of disease spread in population—epidemic, endemic, sporadic etc. Movements in time and place, disease is dynamic not static.

(*f*) Biological gradient of disease, latent and atypical leading to carriers.

(*g*) Principles of control and prevention—methodology depends on changing host or changing environment. When multiple causation is understood appropriate control measure can be applied at selected point.

(*h*) Use of specific problems from Indian situations to illustrate points. These can be worked out by students in seminar discussions and written exercises. This introduces the need for using satistical methods.

3. *Suggested References :*

1. Leavell and Clark, Text Book of Preventive Medicine, McGraw-Hill, New York, 1953.
2. Gordon, The Newer epidemiology in Tomorrow's Horizon in Public Health, Public Health Association, New York, 1950.
3. Gordon, Epidemiology, Diagnostic Discipline of Public Health, Roy, San. Inst. J. 74:445, July 1954.
4. Maxcy, Rosenau's Preventive Medicine and Hygiene, 7th Edn., Appleton, New York, 1951.
5. Simmons, Whayne, Anderson, Horack, Global Epidemiology, Vol. I, Lippincott, Philadelphia, 1944
6. Gladston, Epidemiology of Health, Health Education Council, New York, 1953.
7. Pickles. Epidemiology in County Practice, John Wright, Bristol, 1939.
8. Gordon *et al,* Control of Communicable Disease in Man, 8th Edn., A.P.H.A., New York, 1955.

C. *Community Organisation and Public Health Administration.* 25-30 hours.

1. *Objectives :*

(*a*) To give an understanding of methods of social organisation for the protection and promotion of health.

(*b*) To develop an appreciation of community health resources and agencies.

(*c*) To discuss and demonstrate specific health activities designed to prevent disease for specified groups with particular hazards such as, maternal health, child health, school health, industrial health, mental health etc.

2. *Course Content :*

(*a*) Contribution of social sciences to application of health measures:

1. Individual—personality, beliefs, adaptation.
2. Groups—group sentiment and change, leadership.
3. Community—organisation in groups increasing size and complexity ranging through family, local population unit, state and nation.
4. Culture concept.
5. Community organisation as a public health tool.

(*b*) Health Education—basic philosophy of all health work:

1. Answering felt needs.
2. Helping people to help themselves.
3. Building on successes.
4. Methods used—spoken word, written word—pictures, demonstrations, need for multiple methods.

(*c*) Levels of prevention:

1. Prevention of complications and rehabilitation.
2. Prevention of symptom producing disease by early treatment.
3. Preventing mass spread by treating cases which serve as sources of infection.
4. Prevention of disease by modification of human host.
5. Prevention of disease by modification of environment.
6. Promotion of health.

(*d*) Legal enforcement to protect population—local laws relating to health, state and national laws.

(*e*) Organisation of health departments:

1. Public Health Doctors—administrators, epidemiologists.
2. Public Health Nurses & Health Visitors.
3. Sanitary engineers and sanitarians, vaccinators.
4. Medical social work.
5. Laboratory.
6. Vital Statistics.

(*f*) International health organisation—W.H.O. and aid programmes.

(*g*) Voluntary Agencies.

3. *Suggested References :*

1. Hanlon, Principles of Public Health Administration, Mosby, H. Lewis, 1950.

2. Bhore *et al.* Report of Health Survey & Development Committee, 4 Vols., Govt. of India Press, New Delhi, 1946.

3. Ghosh, Public Health and Hygiene, Scientific Pub. Co., 1935.

4. Sinton, What Malaria Costs India, Health Bull. 26, Govt. Press, Simla, 1939.
5. Planning Commission, Five Year Plan, Govt. Publications, New Delhi, 1953.
6. W.H.O. Expert Committee Reports, No. 83, Methodology of Planning Integrated Health Programme for Rural Areas, No. 9, 31, 73, Mental Health: No. 66, Occupational Health; No. 30 School Health Services.
7. Scott-Williamson & Pearse, Biologists in Search of Material, Peckham Health Centre, Faber & Faber, London, 1942.
8. Smillie, Public Health Administration in the United States, 3rd edition, Macmillan, New York, 1948.

III. *Field Experience :*

A. *Family Adviser Plan.*

1. *Objectives :*

(*a*) To help the medical students to obtain an intimate understanding of the relation of health & disease to the total life of a family through prolonged association.

(*b*) To give the student responsibility for creating and maintaining rapport with a family to learn the fine art being the family doctor whom Osler called the family's "valued friend".

(*c*) To give the student practical experience in carrying out simple technical manipulations related to health by such endeavours as building sokage pits, latrines and smokeless chulas, DDTing for houshold pests, poisoning rats, improving family nutrition through better cooking methods, and teaching the women of the family baby care and sewing.

(*d*) To teach the students to present socio-medical data before a group in weekly class sessions at which 2-3 students present their families for discussion by the class.

2. *Course Content :*

(*a*) At least once a week over a period of 2 or 3 years the student visits his assigned family in the health centre area for at least a 2 hours session. This can be considered his laboratory session, in preventive medicine.

(*b*) The first responsibility of the student is to establish friendly relations with all members of the family, so the first several months should be mainly taken up with friendly chatting and trying to be helpful, for instance if the woman is making food or doing something for the baby a woman student should try to be of help and a man student should work with the man of the family if he finds them busy and is given a chance.

(*c*) The student should arrange for ill members of the family to receive medical help as it is needed and accompany them to the health centre, hospital out-patient department or as they are admitted to the hospital. He should be permitted to attend operations or other special procedures on members of his family.

(*d*) The student gradually collects comprehensive data on all phases of the family's life, particularly as they relate to health. Complete records are kept with a diary of each visit.

(*e*) As the student discovers the major health problems he or she tries to help remedy them using not only their own ingenuity but also the help of any outside specialists or agencies available.

(*f*) Pairs of students are assigned and trained as class specialists in various lines, for example: building smokeless chulas, soakage pits, starting kitchen gardens, DDTing, sewing, baby care, learning better ways of cooking to improve the diet. These class members are called on when any family is found to need help.

(*g*) In the weekly class periods 2-3 students present all pertinent information they have been able to collect and whole class discusses the problems brought out. In each family it is usually possible to develop a specific sociological lesson of importance. For instance, if a family has just moved all of the social implication of establishing themselves in a new place with new friendships and economic relationships can be brought out. If a daughter is to be married, marriage practices and their influence on health can be discussed. A family in which there is a hakim or a faith healer, gives an opportunity to discuss these sources of medical care. Particular care is taken to try to select families containing a pregnant woman, many young children, or a chronically ill person. Each of these situations provides a wealth of practical teaching material to get across to students an understanding of the relation of anything affecting the health of one member to the health of the whole family.

3. *Suggested References :*

1. Gandhi, Rebuilding our villages, Navajivan Pub. House, Ahmedabad, 1952.
2. Brayne, Socrates in an Indian Village, Oxford U. London, 1929.
3. Dube, Indian Village, Routledge & Kegan Pual, London, 1955.
4. Wiser & Wiser, Behind Mud walls, Agricultural Missions, New York, 3rd Printing, 1951.
5. Kanal. Dialogues on Indian Culture, Panchal, Delhi, 1954.
6. Planning Commission, Group Dynamics in a North Indian Village,' Govt. of India Press, Delhi, 1954.
7. Thompson, Better Health, 2nd Ed. S.P.C.K. Box 501, Madras, 1954.

B. *Co-Ordinated O.P.D. Service.*

1. *Objectives :*

(*a*) Since most doctors in practice see patients under office situations far more than at the bedside it is felt desirable to stress clinical experience in the out-patient department in addition to building up ward clinical teaching.

(*b*) To provide for social medical investigation and follow-up of patients seen in the out-patient department in order to bring out possible points of preventive endeavour.

(*c*) To provide integration of the preventive approach with other showing the possibilities of preventive work in surgery, medicine, pediatrics, neurology etc.

2. *Course Content :*

(*a*) Since it is usually impossible to reorganise the entire out-patient department for this type of detailed teaching of social medicine, it may be desirable to arrange for a special out-patient unit in which the Department of Preventive and Social Medicine may have the function of co-ordinating all other activities. This might well be an out-patient clinic attached to a rural health centre.

(*b*) Senior students are given a period of clinical clerkship in this out-patient department during which they are assigned cases to work up. Their clerkship should be long enough to permit them to follow-up patients to learn something about them. It is more important to follow a few patients for several weeks than to have many patients and see them only once. It is desirable therefore to work out a rotation system so that the students assigned to the clinic come one or two mornings a week for several weeks rather than a rotation system which sends them there every morning for one week. Patients seen can be asked to come back on days the student will next be in the clinic.

(*c*) Opportunity should be given for adequate discussion with teaching staff and health workers.

(*d*) Sufficient free time should be allowed to permit home visits.

IV. *Integration of Preventive Teaching with other Departments of Medical College :*

A. *Pre-clinical :*

An important part of the work of a department of preventive and social medicine is to stimulate the teaching of all departments in this field. The preventive approach should not be separated from the totality of medical education. In the pre-clinical years, we want our students to get two things:—

(1) The philosophy of the preventive approach which is to be given to first emphasis in the course of Human Ecology.

(2) Tools which the student will need in later work of learning and applying specific preventive measures. The present pre-clinical courses are primarily oriented towards providing the tools to be used later in curative endeavours. It is up to the department of preventive and social medicine to see to it that while the curative tools are being provided to the students, the preventive tools should also be incorporated. Biostatistics is such an important tool that it is given as a separate course. Specific points at which integration seems to be necessary are:

(*a*) *Genetics.*—When the Anatomy Department discusses embryology and anomalies and the Physiology Department discusses fertilisation there should be included basic data on genetics to give the student a basic understanding of hereditory factors in disease and how they influence distribution of diseases in populations.

(*b*) *Nutrition.*—When the Physiology and Biochemistry Departments are considering the action of the various nutrients definite time should be arranged for in which practical nutrition is presented. Perhaps the Department of Preventive and Social Medicine can arrange to have a nutritionist give certain lectures co-ordinated with the physiology teaching to show the practical application of biochemical information in working out diets and maintaining adequate nutrition. In field work nutritional surveys should be an important part of the work of women medical students.

(*c*) *Medical History.*—In every presentation the historical background gives a useful foundation on which the student can build his thinking. In developing the total ecological approach the historical perspective is particularly important.

(*d*) *Child Growth & Development.*—This is so important in subsequent preventive work in pediatrics that particular attention should be paid to making sure this is adequately covered in the teaching of physiology and anatomy.

(*e*) *Demography.*—This included mainly in the course in Ecology but the broad principles should be kept in mind in other teaching.

B. *Clinical :*

The danger of the present dichotomy in thinking of preventive medicine separately from curative medicine is increasingly recognised. The student should learn to think of curative and preventive methods as parts of the same endeavour differing only in their being applied at different points in the time scale of disease. The idea of levels of prevention should become reflexive in their thinking. Every case requiring curative measures as every incurable case represents a failure of curative measures whether due to inadequate methods or their delayed application. Again specific instances in which integration is needed are:

(1) *Mental Health.*—Increasingly psychiatry is becoming a preventive oriented speciality. If proper environmental situations and good mental hygiene habits can be established many psychiatric problems can be alleviated or prevented. Co-ordination of teaching is a fundamental necessity in getting across to the student this approach.

(2) *Child Health.*—Much of the science of pediatrics is built on the concept that a child should be given optimum conditions for normal growth and developments. In modern pediatrics the majority of the specialist's time is spent in primarily preventive efforts.

(3) *Maternal Health.*—Obstetrics also is becoming increasingly a preventive speciality. The major object of prenatal and postnatal care is to discover incipient trouble and forestall full-blown disease of disastrous emergencies at the time of delivery.

(4) *Family Planning.*—The influence of population growth on health is an important consideration in the epidemiology of health. For optimum health the social unit must be able to provide suitable amenities for its members. Number of people have a great influence on the availability of amenities. The demographic basis of family planning should be brought into the teaching of the Department of Preventive

and Social Medicine although the presentation of technical methodology can perhaps be best taught in the Department of Obstetrics and Gynaecology.

(5) *Nutrition.*—The importance of an adequate diet in good health requires that it be incorporated in all clinical teaching as well as in preclinical work. Specific dietary requirements in various health problems need constant emphasis.

(6) *Communicable Diseases.*—The epidemiology and control of specific infectious conditions can best be taught when the clinical aspects of the disease are being presented. This can be done most easily perhaps by working out a joint course with the Department of Medicine. The communicable diseases can conveniently be grouped epidemiologically on the basis of routes of transmission. Diseases transmitted by the fecaloral short circuit can be presented in detail by the Department of Medicine. The Department of Preventive and Social Medicine can then take up the epidemiology and control of these diseases as a group. Similarly the respiratory, contact, insect borne, and animal transmitted diseases etc., can be grouped and jointly presented. A suggestive ratio of 3 clinical to 1 preventive sessions should cover the material.

(7) *Parasitology and Entomology.*—In some medical colleges this subject is taught by the Pathology Department and in others by the Department of Preventive and Social Medicine. Certainly this group of infectious diseases are ones in which the emphasis should be largely on prevention.

(8) *Field Laboratory Methods.*—Together with the teaching of clinical pathology field trips can be made to the health centre areas in which the students will have been doing their field work in preventive medicine. Laboratory surveys of samples of these populations can provide useful research information. The student will actually collect specimens of blood, urine, stool, sputum etc., and take them to the laboratory for examination. Any positive finding would immediately mean more to the student because he would be seeing not only hookworm ova in a stool, but hookworm ova from a child he has been living in an environment he had seen.

C. *Implementation of Integration :*

The theory of integrated teaching has won general acceptance but its actual introduction into the curriculum is very difficult. The ultimate goal is for every teacher in the medical college to be a teacher of preventive and social medicine. At the present, we have too few teachers familiar with modern preventive and social medicine to staff the departments themselves. The first job of these teachers is to teach fellow staff members. This can best be done in day to day contacts over patients. The Department of Preventive and Social Medicine should provide some service which other departments will respect. If members of the department have sufficient clinical background to meet clinicians on their own ground and act as consultants in special fields such as communicable diseases, venereology, tuberculosis control, industrial medicine etc., this will provide perhaps the best bridge for passing on these concepts of disease prevention. Or perhaps the departmental personnel may be better qualified to serve the clinicians in a specialised laboratory field such as parasitology, bacteriology or

virology. The growing importance of the social sciences may mean that the department can offer services to the clinicians in developing the approach of medical social work. Biostatistics offers a unique and much needed field of service which is "right down the alley" of the Department of Preventive and Social Medicine. In any event, there should be some specialised service which will make the department clinically respected if the desired result of bridging the present gap between preventive and curative medicine is going to be achieved.

Personnel from the Department of Preventive and Social Medicine should routinely participate in clinical-pathological conferences, grant rounds on medical or other services and other joint teaching endeavours. The preclinical combined conferences organised by the department offer an excellent method of gettng each department to place itself in the proper perspective in the total picture of medical education. Even more important, it gives the students a chance to see where the bits of informaton he is picking up from diverse sources fit together to help him understand the problems of health and disease that he is to see.

It will usually be true that certain members of the staff will respond more readily than others. Using the accepted methodology of health education it is important to build on these successes and use them in spreading the preventive approach through the rest of the faculty.

Once the staff is working together in presenting the preventive approach the details of working out curriculum will take care of itself. Much of the teaching of preventive medicine listed above will then be done by the departments themselves. In other instances it will be desirable to start off with and continue the teaching jointly with other departments by working out an arrangement for sharing hours. Suggested examples are in the teaching of communicable diseases, maternal health and preventive pediatrics as detailed above. Joint seminars with representatives of the departments concerned can bring the varying features of specific conditions into a proper balance. As specialists in health education we will consciously be applying our best skills in educating our colleagues but we must remain humble and remember that we too must always be learning preventive medicine if our speciality is to grow and develop as it must in the India of the future.

D. *Suggested References:*

1. World Medical Association Proceedings First World Conference on Medical Education, Oxford University, London, 1954.
2. Clark, K.G. *et al,* Preventive Medicine in Medical Schools, Report of Colorado—Springs Conf. Ass. Am. Med. Coll. Chicago, 1953.
3. Medical Curriculum Committee of British Medical Association, The Training of a Doctor, Butterworth, London, 1948.
4. Prausnitz, The Teaching of Preventive Medicine in Europe, Oxford University, London, 1933.
5. Warren, Synopsis of the Practice of Preventive Medicine, Harvard Press. 1929, Cambridge.
6. Sand, The Advance to Social Medicine, Stanless Press, London, 1952.

APPENDIX 6

DISSECTIONS AND ANATOMY.

First Year Course.

By

Dr. G. M. Kurulkar, Professor of Anatomy, Seth G. S. Medical College, Bombay.

Dissection of the Human Body is considered necessary as a part of pre-clinical training. The hours spent in dissection in different institutions are shown below:—

Name of College	*Hours*
Jaipur Medical College	700
Baroda Medical College	556
G. S. Medical College, Bombay	400*
N. R. Sarkar Medical College, Calcutta	1035
Nagpur Medical College	544
Amritsar Medical College	800
Utkal Medical College	600
B. J. Medical College, Poona	320
Grant Medical College, Bombay	684
Mysore Medical College	1020
Madras Medical College	816

* Includes after dissection demonstration hours and assessment time.

Wide disparity is seen in the number of hours devoted to dissection in different institutions. Some institutions devote more than one third of the available time for pre-clinical learning in dissection only. Total available hours for pre-clinical instruction in two years in a college are 2922 hours. This wide variation in dissection hours must be interpreted as a wide variation in outlooks and attitudes of the different institutions in the matter of dissection.

Dissection gives an opportunity to a student:

1. To gain factual knowledge by direct observation.
2. To gain specific technical and manual skill, useful in surgical procedures.

By planning and integrating dissections with other instructional activities, it would be possible to save time. Dissection should not be an isolated activity, but must form an integrated part of the general teaching in Anatomy. The greater part of teaching of Anatomy could be done in the following four phases:—

Phase I—When a student begins his studies in a medical college, his medical studies should begin with a living body, either his own or his companion's. Much can be learnt without dissection. Mouth, nose, ear, eye, surfaces of a human body and the different body parts, the movements of the joints, various bones and bony points palpable

through the skin, the contours of various muscles, the visible and feelable blood vessels, some glands etc., could be studied with the aid of skeliton and X-ray, under the guidance of the teacher. This phase would take about 20 working hours.

Phase II—The second phase should consist of gross demonstrations, on dissected human body. The aim of the second phase should be to give a student a whole picture of the human body, and its interior. Demonstrations should be chiefly regarding the various organisations in the interior. While showing these organisations, their functional aspects should be stressed. The characteristic of different tissues should be observed. A gross relationship of different structures should be shown. This phase of instruction would last for about 30 hours.

The next two phases begin simultaneously. III(a) phase would be to combine learning with the acquisition of the art of dissection and III(b) phase would be to gain more detailed instruction by means of studying dissected parts.

Phase III(a)—This phase would be a dissection by a student himself. There should be dissection groups each group presided over by a Tutor. Every person in a group should have a part for dissection. The Tutor himself dissects amidst the group. The tutor would guide the whole group in the dissection. Attention should be paid towards the manual skill, and dissecting out gross structures. The whole human body may not be dissected. One limb and abdomen should be dissected by every student. Out of the remaining one major part should be dissected. This phase may require 100 hours.

Phase III(b)—During this phase a student himself studies the dissected parts, integrating his studies with didactic or demonstrational instructions, which he would be receiving concurrently in classes. This study would be somewhat piecemeal, but undertaken concurrently with lecture demonstrations by teachers on different parts of the body. This may require 40 hours.

The first, second and third (*b*) phases are consecutives. The third (*a*) is independent of third (*b*) phase but consecutive to first and second phase.

If planned in the manner shown above the purpose of dissection would be fulfilled and all these phase would not require more than 190 hours.

Besides this planned procedure a student can dissect on his own if time permits.

It would be advantageous, if dissections of an embryo, infant, child, adolescent, and old man are demonstrated to the students, and the departures from the adult conditions are pointed out.

Histology practicals which deal with minute studying of anatomy would require 30 working periods.

Orientation, development, evolution and genetics should be taught in 30 lectures and lecture-demonstrations in gross anatomy aided by visual aid, would be about 40 in number.

All this course can be finished in 306 hours.

The dissections may continue throughout clinical years. The nature and manner of these dissections will have to be determined and correlated with clinical teaching.

APPENDIX 7

A summary of the note on 'Improved teaching of medical students in Mental Health and Psychiatry and the integration of teaching of psychiatry with other medical teaching'.

By

Dr. K. R. Masani
and
Dr. N. S. Vahia

The improvement that have been affected recently in the teaching of mental health and psychiatric subjects to medical students during their undergraduate years may be summed up as follows:—

1. The establishment of a Psychiatry Department or Unit in general hospitals where medical students could be imparted clinical instruction in the subject.
2. Integration of psychiatry with other medical teaching such as general medicine, surgery, midwifery, gynaec., etc.
3. Increase in number of curriculum hours of psychiatry including a course in the psychiatric aspect of general hospital or general private practice with introduction during the previous years of the subjects of Normal Psychology and Psychopathology.
4. The provision of psychiatric ward work and the better utilisation of the psychiatric out-patient clinics in general hospitals and not in mental hospitals for the teaching of psychiatry in regard to the type of patients likely to be encountered in general medical practice.
5. The establishment of Child Guidance Clinics in conjunction with teaching hospitals so as to utilise them for teaching purposes.
6. The adoption of the principle in teaching that the emphasis in psychiatric training should not be placed upon the well defined psychoneuroses and frank cases of insanity, but upon the psychosomatric disturbances and the less advanced and less obvious psychiatric disorders which so frequently complicate general medical and surgical practice.

Undergraduate instruction in psychiatry at present is so inadequate in India that the Committee find it impossible to avoid suggesting some increase in the amount of instruction. Bearing in mind, however, the general desire to keep down the curriculum to a minimum amount, in the following remarks the number of hours of instruction suggested are much less than would be otherwise suggested and are to be regarded as minimum number of hours of instruction.

Systematic courses of lectures and lecture-demonstrations.

(a) *Normal Psychology:*

The minimum of 10 lectures in Normal Psychology, with particular stress to psycho-dynamics of Normal Individuals, supplemented by a section of 8 lectures on Behaviour. Personality and the Dynamics of healthy adjustment.

(b) *Psychopathology :*

Just as it has been found most necessary to teach pathology, before teaching clinical medicine, so it is most necessary to give me medical student a course of instruction of Psychopathology in the third year. A minimum of 10 lectures would suffice.

(c) *Clinical Psychiatry :*

Each student have at least 22 lectures in clinical Psychiatry pertaining to various psychiatric disorders, including the various forms of insanities, the psychoneuroses, the personality and behaviour disorders of adults and children and mental deficiency.

Lectures in psychosomatic medicine integrated along with other lectures in medicine.

At least 22 lectures should be given in series with the other lectures in medicine and the other specialities on Psychosomatic Disorders, *i.e.*, disorders characterised by physical symptoms not due to organic lesions but due to psychological factors, symptoms usually termed 'functional'.

Provision of ward and O.P.D. work.

It is most necessary that every undergraduate should acquaint himself with methods of examination and treatment of psychiatric patients such as are so commonly encountered in general hospital and private practice. It is very desirable that each student should therefore put in a period of ward and O.P.D. work in the Department of Psychiatry of a teaching general hospital for a period of at least 2 weeks both at the Psychiatry O.P.D. clinic and Child Guidance Clinic and the in-patient Department.

Every teaching general hospital should have at least 12 psychiatric beds where various forms of neuroses and early and manageable forms of insanity may be treated, and the undergraduate training should also include a study of such psychiatric in-patients, beside the study of various psychosomatic disorders, which the students encounter in the medical wards.

APPENDIX 8

Summary of note on pediatrics for the undergraduates in medical curriculum in India.

By

Dr. S. T. Achar, Professor of Pediatrics, Medical College, Madras.

Pediatric undergraduate training in India should, in my opinion, consist of the following:—

1. *Teaching growth and development* of the normal child both by systematic lectures and attendance at properly organised well baby clinics and child welfare centres—at present in most medical colleges there is no systematic teaching on the growth and development of normal child without which it is not possible to fully comprehend the departures from the normal growth and development.
2. Instruction on the *Diseases of the New Born* to be undertaken preferably by the Pediatricians but now they are left to the obstetricians in most colleges especially as the new borns are under their care. It does not matter whether the obstetricians take these subjects, so long as they take interest and have some clinical training in this aspect of pediatrics. But in practice their interest is in obstetrics and this aspect of pediatrics is neglected.
3. *Diseases of children.* Most places have children's ward and some colleges have pediatric department. In effect the clinical clerking in children's ward which varies from 1 month to 2 months in various colleges is done in some places under the guidance of pediatricians and in other places under the guidance of physicians in charge as part and parcel of medical postings. It does not matter whether it is the pediatrician or physician who teaches so long as there is proper instruction and students get training on the methods of examination of children and watch the progress of children during disease process because that part of pediatrics forms a big slice of the general practitioners' daily work and also forms a slice of public health work too. But it is necessary where there are no pediatricians that the physician himself should be trained in the methods of examination of children and have adequate knowledge of pediatrics.

From all the foregoing I feel that it is necessary that this posting in pediatric department should be for 3 months on the whole in a proper pediatric set up spread as follows:—

1 month in 3rd year—

Teaching to consist of methods of examination of children in health and disease but not diagnosis. History taking; examination of health of new borns and infants—lectures on growth and development—attendance at Well Bady Clinic under the supervision of Professor of Pediatrics.

1 month in Final Year—

Clinical ward and out-patient posting in the pediatric department. For these two items students should be in small batches of not more than a dozen or 20. Systematic lectures in final year on pediatric subjects (Diseases of new born and of children) during the long term once a week.

1 month Internship in pediatric wards during the last year which is now going to be devoted to internship.

Merely setting apart of 3 months in the medical curricula is not sufficient. There must be qualified staff—call them pediatricians or if the obstetricians want to look after the care of new borns under them, they may do so after training in neo-natal pediatrics ; the child welfare medical officers of such of the Well Baby Clinics which are selected for students ; trainees should also receive adequate training and the whole programme must be under the guidance of the pediatric department and so it is necessary to organise a pediatric department in each medical college in India.

APPENDIX 9

EXTRACT FROM A NOTE ON POST-MORTEM.

By

Dr. P. N. Wahi, M.D., M.R.C.P. (Lond.), Professor of Pathology, Medical College, Agra.

S. No.	*Name of the institution*	*Number of post-mortems*
1.	G. S. Medical College, Bombay	516
2.	N. R. Sarkar Medical College, Calcutta	639
3.	Grant Medical College, Bombay	1050
4.	Osmania Medical College, Hyderabad	57
5.	Stanley Medical College, Madras	43
6.	Christian Medical College, Vellore	221
7.	Medical College, Calcutta	202
8.	T. M. M. College, Bombay	159
9.	B. J. Medical College, Poona	323
10.	Medical College, Madras	575
11.	Medical College, Mysore	79
12.	Medical College, Lucknow	262
13.	G. R. Medical College, Gwalior	38
14.	Chitranjan Seva Sadan, Calcutta	28
15.	Medical College, Nagpur	149
16.	Medical College, Amritsar	401
17.	Medical College, Indore	18
18.	S. N. Medical College, Agra	17
19.	Lady Hardinge Medical College, New Delhi	10
20.	Guntur Medical College, Guntur	100
21.	Andhra Medical College, Vishakapatnam	173
22.	Medical College, Baroda	110
23.	Medical College, Jaipur	134
24.	Kasturba Medical College, Manipal	42
25.	Medical College, Trivandrum	40

It will be noticed that out of the institutions which supplied the information, in 8 the autopsy examinations are below fifty per year. The bulk of the bodies available for post-mortem examinations are below fifty per year. The bulk of the bodies available for post-mortem examinations are destitute bodies. It is only occasionally that the relatives give permission for autopsy. The bodies are

available for post-mortem after 48 to 72 hours of death. This period is necessary to declare a body as "destitute". From the point of a satisfactory autopsy this is undesirable as decomposition is likely to set in due to intense heat most of the year.

In many provinces there is interference by local religious, or social bodies. For instance in Madras, till recently no autopsy could be done on a Christian or Mohamedan even if it was a destitute body. In U.P. both Hindu and Muslim social bodies could claim a destitute body for disposal and thus prevent an autopsy except in Greater Bombay where the Coroner can order a post-mortem when the cause of death is not known. Power is also vested in the Coroner to order a post-mortem if a person dies after an operation.

From the above facts, it is obvious that the conditions regarding the performation of post-mortems in India are far from satisfactory.

SUGGESTIONS TO IMPROVE THE EXISTING CONDITIONS.

There is a general uniformity of opinion amongst the teaching staff, regarding the desirability of increasing the number of autopsies. This cannot be possible unless there is an all out co-operative effort on the part of the attending clinical staff in persuading the relatives to give consent for post-mortem and to educate the public. It may appear that a legislation to do autopsy examination on every dead body in the hospital should solve the problem but this is impracticable, as it is likely to evoke public protest and may lead to unpopularity of the hospitals. However, an authorisation to conduct an autopsy examination on all bodies where the diagnosis could not be established is urgently required. This could be achieved by the appointment of a Coroner in all big towns. It is also essential that the various religious organisations should not be empowered to claim destitute dead bodies without an autopsy. An act of the government may be required for this purpose.

However, rules are only secondary to the objective that dictates them. The real way to achieve the objective is to educate the public regarding the importance of autopsy to the patient in diagnosis and treatment, to the cause of medical science and the hospital's contribution to society. The chief persons concerned are the clinical staff. Without their active co-operation, relative's consent will not be available. At the same time, the responsibilities of the pathologist are too obvious. The autopsy should be performed within the shortest period and the body handed over to the relations without any mutilation. They must be so conducted as aid the clinical staff. The autopsy as a scientific investigation of everything must be done to maintain an atmosphere of studious enquiry. The pathologists should extend all possible consideration to the clinicians. When giving the autopsy findings they must be appreciative of the difficulties which beset clinical fiindings. In this way only can they ensure the co-operation and active participation of the clinical staff.

The Indian Association of Pathologists has made the following recommendations to the various institutions and the Provincial Governments in order to improve the available number of post-mortems in teaching institutions:—

1. Appointment of a Coroner in all large cities.
2. Clinicians taking greater interest to obtain dead bodies for examination.
3. Legislative enactment to preclude religious organizations from claiming dead bodies from the hospitals.
4. All unclaimed dead bodies to be post-mortemed within 24 hours.
5. To include medico-legal post-mortems for studies in Pathology.

PROBLEMS TO BE CONSIDERED BY THE CONFERENCE.

The important thing to be considered by the Conference is to recognise the fact that autopsy is an essential feature of undergraduate and postgraduate medical education. Then to consider:—

1. In what capacity should the student participate :
   (*a*) as an active participant,
   (*b*) as an active onlooker throughout all stages, or
   (*c*) should the gross specimen and histology be demonstrated to him by the prector in special conference, and the student encouraged to attend clinico-pathological correlation ?
2. What is the minimum number of post-mortems which a student must deal with in various capacities?
3. Is is necessary to include the medico-legal post-mortem for teaching of undergraduate students in view of the scarcity of pathological post-mortems?

It would be useful to consider and make concrete suggestions regarding the means to increase the number of available dead bodies for autopsy. This would also directly increase the number of bodies available for dissection by the students of Anatomy, as after autopsy the destitute bodies would be sent to the Department of Anatomy.

APPENDIX 10

A NOTE ON TEACHING OF INTEGRATED CURRICULUM OF MEDICAL COURSE.

By

Dr. S. G. Vengsarkar, M.D., F.C.P.S., Bombay.

" If modern medicine is to deal with man as a whole, teaching and research centres must learn to co-ordinate their activities towards this goal ".

Lester J. Evans.

Introduction.

The main objective of medical education is to provide a basic education to the student to become a general practitioner, a specialist, a teacher, a research worker or a health worker. The mission of medical education includes promotion of health, prevention of illness, care of patients, rehabilitation of patients, teaching and research.

It is an axiom that all true education is self education. The unit of education should be therefore the student and not the course. The curriculum hours of faculty and methods of instructions should be modified to suit proper development of the student.

The present state of medical education.

The present curriculum has been defective in achieving the objectives of medical education.

It is evident that the present unintegrated curriculum is the result of strict compartmentalisation in pre-clinical or basic and clinical divisions which in turn is an outcome of the rigid acceptance of subject-wise courses and the system of detailed subject examinations which rely upon memory. The teacher also adopts his instruction to the type of examination and examiners and the student avoids any study that is unlikely to be required in examinations and by examiners concerned. With the advances in medical sciences and addition of newer departments of specialities and efforts are made to familiarise the students within $4\frac{1}{2}$ years course with more and more facts and techniques in every field of medicine. The doctor who is trained thus has neither a co-ordinated knowledge nor a proper aptitude developed.

To mould the curriculum it would be necessary to redefine the objectives of medical education.

Objectives of medical education.

" Man works in health and suffers in disease as a whole, and therefore the structures and functions of the tissues and organs of a man which work as a unit of the body along with the mind cannot be studied in health and disease in an isolated, segmented and fragmentary manner. Students . . . . must know man as a whole, in disease and in health ".

It has been observed above that compartmentalisation of medical curriculum into a separate and unconnected pre-clinical and clinical phases has led to the partial segregation of these elements in medical education to the detriment of each. It must be remembered that the character of student's training in the pre-clinical subjects largely determine his mental attitude and intellectual method required in the clinical part of the course. It is therefore most important that the clinical teachers and the teachers in the pre-clinical subjects should co-operate in securing continuity in the curriculum and a proper dovetailing of their respective teaching so that the students' educational progress throughout the whole medical course may be smooth and logical. All aspects of medical course should blend together into a unified experience to a student while receiving medical education.

If the above aim of medical curriculum is agreed upon, then it follows: -

i. That the teachers must be first orientated to this educational aspect. This can be achieved by discussions amongst the heads of all the related departments without dividing them into basic and clinical sections. Such conferences should try first to plan the curriculum for the study of man as a whole with regard to the structure, function, growth and behaviour.

ii. It is desirable that the teacher should adopt methods and alter or modify the curriculum to suit the varying needs of the student's education in different schools.

iii. That efforts will have to be made to provide educational opportunities and suitable environment for the student to develop correct attitudes and motivation in order to acquire knowledge to the best of his capacity.

iv. That the student should be given increasing responsibility for his own education according to his abilities and interests.

v. That a period of time should be available to the student for electives, library reference, thinking, experimentation and reference to departments.

vi. That the curriculum should be suitably planned and methods of teaching be adopted to achieve these aims and objectives.

vii. That the student should be helped to learn the approach to the study of normal human biologic nature, to understand and learn the basic principles, methods, the scientific evaluation of the data, the basic principles of medicine, the clinical evaluation of patients and the approach to solve the problems of patient and his care upto his rehabilitation.

Planning of the curriculum.

For this purpose a Committee on Education consisting of departmental heads of all the subjects required for the medical course should be organised first. It should constantly function throughout the entire course:

1. The Head of each department should first submit a teaching scheme in relation to his own subject. He should criticise the defects and offer suggestions for improvement, point out overlapping areas between his and other subjects and measures for collaborations with related departments.

2. The Heads of the Departments then should discuss in conferences, the suggestions offered by each head and plan a co-ordinated programme of teaching for the entire course.
3. As there are no standard text books for integrated teaching, a suitable syllabus should be prepared for circulation amongst staff and student.
4. In order to operate this integrated teaching to its logical end, the students should be divided into small groups and be placed in charge of a tutor (Preceptor) who should be their guide and adviser. This tutor should watch the student's activities, solve their difficulties, guide him in his educational efforts, follow his progress and assess his knowledge.

Sample of integrated curriculum (Western Reserve-pattern).

In the first year of the medical course, the curriculum should cover study of human biology, by correlating structure, function, growth and behaviour of man. He should be introduced to the patient-physician relationship also in this year which should be continued in the 2nd and 3rd year of his course, when he acquires knowledge of principles of medicine, natural history and mechanism of disease, prevention of illness. In the 4th year, he should be in a position to apply the knowledge of human biology and principles of medicine to the cure of patients in a more responsible way.

First year.

The first programme should be the orientation of the students to the medical course. With a view to enable a student to study the man functioning as a unit rather than as separate science disciplines, various disciplines such as anatomy, histology, physiology, bio-chemistry, pharmacology, pathology, preventive and social medicine, psychology as well as clinical specialities should be interwoven towards the study of a cell, systems such as loco-motor circulator, respiratory and organs, with an emphasis on structure, function, bio-chemical activities, growth and development.

The study of gross anatomy should be reduced to the minimum necessary hours, postponing a part of gross anatomy and dissections to the 2nd and 3rd year for correlating with clinical study.

At this time, arrangements should be made for practical classes, lectures and group discussions to deal with:

a. emotional nature of man.
b. patient-physician relationship.
c. environment in which the infant grows.

In this connection, in the anti-natal clinic, he should take history of pregnant woman, examine her, follow the course of pregnancy and foeal development at home and the clinic, observe delivery and follow the mother and the growth of the infant thereafter.

The physical examination should be correlated with basic science material. Personality, growth and development of infant should also be studied by arranging an integrated programme.

For critical scientific evaluation, the student should be introduced to elementary bio-statistics in the first 6-8 weeks for about 30 hours.

Second and third year course.

In the second and third year course, the student should study the alterations in the biology of man in structure, function, growth, development and behaviour and the natural history of diseases with emphasis on principles of medicine, mechanism of disease and its prevention, pathological changes, principles of treatment of diseases, methods of diagnosis and clinical manifestations. In doing so, the departments of clinical specialities and the biology section should co-ordinate and have a co-operative plan for study of patient as a whole with regard to the diseases of organ or systems, instead of study of diseases as a disease entities in the separate disciplines in medicine, surgery, gynaecology obstetrics etc. A student should learn how to observe and evolve diagnosis and understand definite principles concerning mechanism of illness and treatment.

The objectives of this period should include reapplication of material learnt in the first year and produce a natural transition to the fourth year in which there should be larger emphasis on the care of patient. This period of study should, therefore, present the principles of medicine related to the processes of diseases and to the problems of the patient. It would include study of tissues and organ system together the symptoms, signs, diagnostic methods in relation to structural and functional changes induced by disease. Patient should be studied to serve as an example of several aspects of the disease. Gross dissection should be made and demonstrations arranged in relation to organ or system under study. Students should be given increasing responsibility in diagnostic methods, history taking, physical examination, laboratory examination and study of patient as a member of the society. Students should carry out studies in hospital wards, out-patient departments and home. Study of growth, development and behaviour begun in the first year should be continued with emphasis or abnormal behaviour.

The biological and clinical science departments should co-ordinate in presenting integrated study of disease. Similarly in the bio-chemical study programme one member from the biology science section and another from the clinical science section should combine for laboratory study of patients, for affording an opportunity to students to study a selected disease in detail to gain more experience and also to illustrate the contributions both by the biology and clinical science divisions in the study and elucidation of the disease.

Fourth year.

In the last year, that is, fourth year, the student's study should concern with the actual care of the patient where he should apply the knowledge of biology of man and principles of medicine to the care of patient in the hospital, out-patient and home upto the point of rehabilitation. His education should be a continuous process from the biology section of first year through the 2nd and 3rd years upto the end of 4th year. The student should be given more responsibility under guidance for the complete handling and care of the patient whether in the hospital, out-patient or at home.

Results of integrated education.

By planning an integrated curriculum, as mentioned above, the following defects in the present curriculum would be removed:—

i. A hiatus between basic science group and clinical science group will be bridged and removed.

ii. The student who is being spoonfed and instructed in a cooked-book type would cease being taught and would rather learn and be helped in his self education by his preceptors.

iii. The piece-meal study of man both in the basic science departments as well as in the clinical specialities will be replaced by study of man from all aspects with regard to his biology and disorder.

Assessment.

In order that this integrated teaching should be a success and beneficial for self education of students, first a change in environment, *viz.*, consideration of the subject of examination is essential. Repeated examinations are considered as a series of hurdles.

Piece-meal type of training required piece-meal subjectwise examination which tests are for memory of facts and techniques. As the proposed method of education would replace piece-meal study of disease in the different biological and clinical specialities, and in its stead there will be comprehensive study of man in health and disease, it would be consistent with this mode of education that the evaluation of students progress and education should be carried out (i) from the day as he learns and educates, and (ii) at the end of every year in a comprehensive way by the teachers in charge who observe his development and education. During the process of development and student's education, (i) the preceptors concerned should quiz and question as surprise tests once in 3 months without grading the assessment but with a view to knowing what effect the teaching had on the students and whether any modifications in the teaching is necessary, (ii) the yearly comprehensive examinations should be co-relative and should be capable of assessing as to whether the student is developing and being educated correctly at a desired level.

Finally, in order to achieve the desired objectives of medical education, by adapting the integrated methods of instructions for self development of students, following essentials should be secured:—

i. Proper selection of students for admission.

The students should be selected on the basis of not only high academic achievement but also of qualities of personality and aptitude by suitable tests for the same.

ii. Proper selection of teachers of suitable calibre, ability, tact and attitude.

iii. The establishment of full time departments both on the biological and clinical sides with adequate number of full time and part time assistants and facilities.

iv. Last, but not the least, the important factor is the independence of schools for educational experiments and research.

Independence of medical schools and leadership.

"Given a competent faculty, a school must be independent of any domination or coercion in the development of its teaching and research programmes as long as satisfactory standards on medical education are maintained. These programmes will differ in various schools, depending on a variety of factors. The great progress which has been made in medical education in this country has been due in a large measure to the independence of schools in developing their own teaching and research programmes". H. G. Weiskotten, Dean, Syracuse University School of Medicine, President of the Council of Medical Education and Licensure held in 1949 at Chicago.

He further stressed that "either in its Dean, with his faculty or in the faculty itself, the school must have sound, intelligent effective leadership which views the school as an integrated whole in regard to its education and research programmes, its relationship to hospitals and out-patient clinics and to all health and medical programmes of the area in which it is located, as well as its place in the nation as a whole".

With the present rigid requirements of medical schools, there is more or less rigid uniformity of medical courses. An important feature of a medical school should be that there should be no uniformity or rigidity of medical curriculum which is considered as educationally bad and unsound. Medical education should be treated as a subject for experimental research and constant efforts should be made to improve it. Experimentation is made possible by the freedom of medical schools to develop their own course and teaching methods which will vary from State to State, and School to School dependent on varying factors.

The medical schools should be granted this their birth right in the interest of medical education, society and nation. The medical educationists from all the medical schools should meet every year on a common platform to discuss educational problems at conferences organised by a representative body, *viz.* All India Medical Colleges Association, which should be organised in the interest of medical education in this country.

APPENDIX 11

INTEGRATED COURSE AT LUDHIANA.

An attempt has been made to organize a curriculum within the framework of existing university regulations which provide co-ordinated teaching in Pathology, Pharmacology, medicine. surgery and preventive medicine. Preliminary division of teaching with blocks of time being assigned to departments has been worked out but final details of specific subjects to be covered are still being discussed. The following points have emerged from our discussions:—

(1) In preclinical years our only successful integration thus far has been in combined clinical conferences given once a month for each class when a case of general interest is presented and discussed in turn by representatives of each department.

(2) An introductory course of 2 months is planned to start immediately after the students finish their first professional examination. This is covered in Table I.

(*a*) It can be seen that the clinical part of this is concerned mainly with methods of history taking and examination. Medicine and surgery will, however, also be giving some general introductory material.

(*b*) The 8 medical ethics lectures will cover the basic courtesies of ward behaviour and relationship with nurses and other auxiliary staff. Then general ethical principles especially in relation to patients be discussed.

(*c*) The library course will give theoretical and practical background in the use of the library, organizing bibliographies, and how to get what one needs from literature.

(*d*) The Pathology and Pharmacology sessions at this stage will be covering basic principles such as tissue damage and repair, inflamation, tumor growth, etc., in co-ordination with the clinical presentations.

(*e*) The preventive medicine sessions will continue the village field work with families started in the previous year.

(3) The complete clinical course has been divided into two parts:

(*a*) Lectures, clinics and seminars being taken-up separately from (*b*) ward work. It was found that co-ordination of teaching was feasible in the (*a*) but not in (*b*).

(4) The daily routine outlined in Table I will be continued except that the ward work will be divided.

(5) In Table II the lectures available to each of the clinical departments are indicated. These are to be co-ordinated as far as possible. It seemed best for Pathology to set the pace as to the areas of the body, the systems, or the subjects to be taken up serially with the other departments to follow along as well as they can.

(6) The Ward word and clinical clerkship have been broken down as indicated in Table III.

(7) Combined clinics with members of various departments discussing cases will occur at least once a week.

(8) Communicable diseases will be taught jointly by Bacteriology, medicine and preventive medicine.

TABLE 1.

INTRODUCTORY COURSE

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
8·30	Medicine	Surgery	Medicine	Surgery	Medicine	Preventive Medicine
9·30	*		Med. Ethics. Library		*	Preventive Medicine
10·30	**	**		**	**	
2—5	Pathology	Pharmacology				Free

* During first 4 weeks—given to lectures in Physical Examination, History taking. During last 4 weeks given to surgery.

** Physical Examination Course.

DETAIL OF HISTORY TAKING AND PHYSICAL EXAMINATION COURSE.

Weeks 1—3

First hour—lectures—

History Taking	2 Hours
Examination of Heart	1 ,,
Examination of lungs	1 ,,
Neurological Examination	2 ,,
Abdominal Examination	1 ,,
Examination of breast Lumps	1 ,,
Examination of head and neck	1 ,,
Examination of children	1 ,,
Examination of extremities.	1 ,,
	10 Hours

Week 1.—Second and Third Hours, practical in history taking.

Week 2, 3, 4, and 5.—Practical in systemic physical examination

	Monday	Tuesday	Thursday	Friday
Group A	1,1,5,5	2,2,6,6	3,3,7,7	4,4,8,8
Group B	2,2,6,6	3,3,7,7	4,4,8,8	1,1,5,5
Group C	3,3,7,7	4,4,8,8	1,1,5,5	2,2,6,6
Group D	4,4,8,8	1,1,5,5	2,2,6,6	3,3,7,7

1—Examination of heart (med.)
2—Examination of lungs (med.).
3—Examination of abdomen (Surg.)
4—Examinatinn of Extremities (Surg.).
5—Examination of breast lumps (Surg.).
6—Examination of head and necw.f (Surg.).
7—Examination of neurological (med.).
8—Examination of children (med.).

Weeks 6, 7 and 8.—Practical in history and physical examination, checked by instructors

TABLE II

Schedule of Clinical Lectures or Clinics.

	1956							1957							1958					
	Ob.	Med.	Surg.	Eent.	Ph.	For.	Total	Ob.	Med.	Surg.	Eent.	Ph.	For.	Total	Ob.	Med.	Surg.	Eent.	Ph.	Total
January	..	..	..	..	..	..	..	4	6	6	..	4	8	28	4	12	12	8	4	40
February	..	12	8	..	4	..	24	4	6	6	..	4	8	28	4	12	12	8	4	40
March	..	12	8	..	4	4	28	..	..	..	..	..	..	..	4	12	12	8	4	40
April	8	8	4	..	4	4	28	..	..	..	..	..	..	..	4	12	12	8	8	40
May	8	8	4	..	4	4	28	8	12	8	8	4	..	40	4	12	12	8	4	40
June	..	..	..	..	..	..	..	8	12	8	8	4	..	40	4	12	12	8	4	40
July	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
August	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
September	4	6		..	4	8	28	4	12	12	8	4	..	40	..	..	..	..	..	..
October	4	6	6	..	4	8	28	4	12	12	8	4	..	40	..	..	..	..	..	..
November	4	6	6	..	4	8	28	4	12	12	8	4	..	40	..	..	..	..	..	..
December	4	6	6	..	4	8	28	4	12	12	8	4	..	40	..	..	..	..	..	..
TOTAL	32	64	48	..	32	44	220	40	84	76	48	32	16	296	24	72	72	48	24	240

Forensic 60 GRAND TOTAL . 96 220 196 96 88 756

TABLE III

Clinical clerk-ships for class starting ward-work in December 1, 1955.

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1 9 5 5												Introductory course
												Pathology. Pharmacology
1 9 5 6	A	I	Gr. A—2 mo. MED. OPD 2 mo. MED. Wds. Gr. B—2 mo Surg. OPD 2 mo, Surg. Wds.			2 months OB—GYN 1 month		Gr. A—2 mo. Surg. OPD 2 mo. Surg. Wds. Gr. B—2 mo. MED. OPD 2 mo. MED. Wds.				
			Pathology Pharmacology				Holiday			Pathology Pharmacology		
												Clerkship.
1 9 5 7		Jan	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
		1 mo. Elect. ½ mo Xray.		R E V I EW	E X A M S	Gr. A MED Wds. Gr. B. Surg.		1 month OB-GYN 1 month		Gr. A-PED Gr. B-MED		SURG. PED
		Pathology Pharmacology			E X A M S	Gr. C. PED.		H O L I D A) Y		Gr. C-Surg.		MED
												Junior Dressership.
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
	Gr. A MED DRESSERS OPD. 2 mo.		1 mo	Gr. A Surg. Dressers 2 mo. Surg. OPD 1 mo.			E	H O L I D A) Y	R E V I E W	E X A M S		
	Gr. B. Surg.			Gr. B. MED.			N T	A Y				
												Senior Dressership.

APPENDIX 12

Suggestions for Intergrated Teaching

BY

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Integrated teaching aims at the students mind, to train it through a series of unified presentations of the diverse disciplines of medical science. To achieve total integration in Indian Medical Colleges a large number of prerequisite conditions would have to be satisfied. Some of these are a much higher " teacher to students " ratio, the availability of full time clinical teachers, a thorough overhaul of the examination systems, etc. It has to be realised that these prerequisite conditions will take a long time to be satisfied. In Baroda we have tried to explore the idea whether a degree of integration—or at least co-ordination—cannot be usefully introduced with fewer prerequisite demands. The statement below is the result of such an attempt.

It is drawn within the current framework of divisions according to examinations. Admission after Inter Science (B) ; (i) M.B.B.S. examination after one and half year's teaching, in Anatomy including Embryology and Physiology including Biochemistry ; (ii) M.B.B.S. examination, 2 years later, in Pathology including Bacteriology, Parasitology, Forensic Medicine including Toxicology and Pharmacology ; (iii) M.B.B.S. examination, 1 year later, in Medicine, Surgery, Obstetries and Gynaecology and Preventive and Social Medicine. Its major emphasis is on " horizontal co-ordination " and wherever it is felt practicable a certain amount of " vertical co-ordination " is also attempted.

On admission, it is proposed to give the student an ' orientation programme ' of about two weeks. During the " Lecture hours " topics like " Man as a living being ", " Man and his environment ", " Medicine a science ", " The living and the dead as objects for study ", and " The need for and the role of experimental animals " are presented. The collaboration in this programme of clinical teachers is considered possible but it is being left to be worked out from time to time. The main objective is to emphasise the great need for an early study of " preclinical " subjects.

During the " practical hours " a rapid survey of the organs comprising the various " systems " is presented on the living and the dissected body. A " guided tour " of the college (and hospital) is arranged in batches. Emphasis is mainly given to the library and the various museums. (The students are shown the " Departments " of the hospital and are instructed how to go about obtaining aid if they need it). The regular " departmental " teaching now begins. The department of Anatomy arranges its programme in such a manner that the broad gross ' lie of the land ' anatomy of every " physiological system " is presented each time the department of physiology begins presenting and discussing it. Also that the histology of tissues of which the function and functional organisation is to be presented by physiology is learnt before hand. For the rest of the course, except for Neuroanatomy (*vide infra*) Anatomy follows its own independent programme. As far as the teachers consider it desirable, opportunity is always taken to emphasise the " medical " interest in the area under presentation

It is felt that attempting further " integration " with physiology is not practicable without some detriment to either discipline and is unlikely to be of real value to the student.

The department of physiology mainly concentrates on integrating 'physiology' with Biochemistry. It is felt necessary and useful to begin with food. The chemistry of food materials is presented by the Biochemist. (This has also the advantage of making up the deficiency in organic chemistry which most students read). Simultaneously, the concept of " stimuli and responses to stimuli " in biology is presented. The use of the nerve muscle preparation for this is felt to be very apt. In the " practicals hours " chemistry of foods and the experimental set-up for nerve muscle preparation is done. (It has to be noted that this part of experimental physiology is too much emphasised at present mainly because of the method of examination. This will need to be changed radically. By far the only utility of technical skill is mounting the n-muscle preparation and recording its responses to single or multiple stimuli is to introduce the concept of variation in stimuli causing corresponding variation in responses and to practise the converse, *viz.*, to attempt seeking the stimulus by arguing backwards from the responses within the limits of the experimental method. To force students towards a machinistic reproduction of some fixed kymograph-figure must be actively discouraged. The examinations need to be moulded).

Likewise, topics like Digestion, Metabolism, Water balance and urine secretion are to be presented jointly by physiology and biochemistry. Respiration, endocrines (and their influence on metabolism) are also areas where a degree of co-ordinated presentation of physiological and biochemical aspects is possible.

It is felt that some areas amongst those noted above land themselves very usefully to integration with basic pharmacology. In particular, the digestive ferments, vitamins, blood volume and water balance, endocrines and red blood cell generation (chromogenesis as well as cell maturity) can be taken. It is felt that the attitude of pharmacological contribution should be to complement the physiological and bio-chemical presentation, and NOT to present therapeutic applications. These latter must be left to a later time.

The remaining area that related to the nervous system is one where it is felt that Physiology and Anatomy can very well co-ordinate their teaching. In the area of autonomic nervous system pharmacology can be very valuably co-ordinated again as basic pharmacology to complete the picture. (It is felt, for example, that pharmacology could present demonstrations to clarify the differential sites or stations in the autonomic effect or arc, and present a few drugs affecting these sites to bring them demonstrably in view). It would also be possible to demonstrate the points common to the so-called 'Central' and 'autonomic' systems.

A word about bringing clinical material into the teaching of Anatomy and Physiology. Obviously this is useful. However, it must not be overdone. It must not be used with the hope or design of making an " otherwise dry subject " interesting. There is enough interest in these basic preclinical sciences. As has been said, the bringing in of patients should not be an apologetic " Holding of the clinical carrot to make the preclinical donkey go ". It is felt that the preclinical teacher has ample enough medical background to present such clinical material himself in most cases. Facilities for free access to the clinical wards are all that is needed for the teacher. This could be ensured by placing the preclinical teacher officially on the staff of a clinical department and a member of the clinical department on the staff of the preclinical department in return.

Of course, in a few cases members of the clinical staff may also be called upon to help with the integration.

The presentation of the course after this is geared to the convenience of teaching one of three clinical subjects, Medicine, Surgery and Obstetrics. It is clear that early in his sudy in the wards the student has to familiarise himself with a number of practices and to acquire some skills, for example, applying surgical dressings, observing analgesic, sedative and hypnotenic medication, fluid balance restoration (management of shock) and antieffective therapy including antibiotics, etc. It is most essential that he comprehends the scientific basis of these practices and skills as early as he can. While therefore the three main subjects are presented as a major part of the study, the disciplines of Pathology, Bacteriology and Pharmacology should co-ordinate their teaching so as to furnish these fundamentals as early as possible during the early period.

Thus it is suggested that in the third year first term, the major emphasis should be given to general surgery, for example, principles of treatment of injuries (including elementary treatment of fractures). Details of nursing aids should also be learnt/taught during the first 6 weeks or so. Pathology correspondingly begins with " injury and repair ", introduction to pathogenic organisms and sterilisation. Pharmacology should cover general actions as explained by non-specific anti-infectives and develop to selective action as by specifics like penicilin, etc. Preventive and Social Medicine should present aspects of disinfectants as applied to public health. Forensic medicine offers the legal approach to kinds and effects of wound injuries. During this time, it is expected that in the wards major emphasis is laid on signs, symptoms and their interpretation on the basis of the related pathology and physiology. In the later portion of the term general surgery of shock and haemorrhage should be taken up and integrated with the pathology and pharmacology of fluid balances while preventive medicine concerns itself with the avoidance of pollution of water and food. It is suggested that at this stage medicine with gastro-intestinal system should be introduced with a backward integration with physiology and biochemistry for digestion and G. I. motility. This is felt to be a simple system and commends itself as a good beginning to medicine as a subject. Preventive medicine then details its discussion on prevention of G. I. infection and related elementary parasitology.

Later portions are likewise presented in an integrable manner. In the third year, second term (a shorter term) Medicine takes infective diseases. Pathology of inflamation and neoplasms presented and this co-ordinates well with teachings in surgery. Pharmacology deals with the nervous system, anaesthesiology co-ordinating.

In the 4th year, the Pathology and Pharmacology of blood is presented as Medicine discusses diseases of blood and circulatory system. Simultaneously, the teacher in Obstetrics presents the physiology of menstruation and pregnancy (aided for integrating it, by the Physiology department). The endocrines are next taken up in Medicine and Physiology and Pathology thereof is presented along with the related areas in medicine. Obstetrics is introduced and as normal labour is discussed, maternity and child welfare as also family planning is taken up by the Professor of Preventive and Social Medicine ; the legal aspects of abortion, etc., being taken up by Forensic Medicine department. In the 4th year second term specific diseases are taken up in Medicine and in Pharmacology drug treatment especially chemotherapy of diseases is covered in joint clinical pharmacological sessions. Prevention of these specific diseases is introduced as specialised application of the principles of Preventive Medicine which have

been discussed earlier. Likewise special Pathology as an application of the principles of general Pathology and Bacteriology to special tissues is presented.

After the 4th year (*i.e.*, when Physiology, Pathology and Forensic Medicines have finished and second examination is over) the major concentration is shifted to the specialities which are presented as an application of general principles already enunciated in the past training programme. The Medicine, Surgery and Obstetrics including Gynaecology take the field and Pediatrics, V. D., E. N. T. Ophthalmology, Dentistry co-ordinatic with them.

Fifth year is to be planned as an acme of the programme, of little integrational contributions from all the relevant disciplines.

NOTE 1.—In the Medical College, Baroda, it is believed that satisfactory integration will take sometime. It has to develop. A beginning has been attempted to co-ordinate parts of various disciplines through didactic lectures, lecture-demonstrations and clinical conferences.

2.—In the pre-clinical period there are 3 academic terms and the teachers in Anatomy and Physiology have drawn up the following tentative programme:—

I. *Term.*—

Anatomy	Physiology
Gross Anatomy emphasising the evolutionary aspects.	Muscle, Nerve, Blood and Lymph circulation.
Anatomy of cell, organs and tissues.	Food, Nutrition, Digestion, Metabolism
Embryology-theory and practicals.	Biochemistry (intensive) Proteins, Fats. Carbohydrates, Blood.
Dissect—Extremities.	Chemistry.

II. *Term.*—

Anatomy	Physiology
Dissect major parts (neck and Brain, Thorax, Abdomen).	Blood (detailed).
Lec-demonstrations.	Cardio Vascular Respiration.
	Endocrines.
	Excretions.
	Bio-chemistry.
	Biophysics (Principles) Enzymes.
	Urine, Blood, Body Fluids.

III. *Term.*—

Anatomy	Physiology
Dissect Major Parts—*contd.*	Central Nervous System.
Details of Central Nervous system.	Special Senses.
	Endocrines.
	Reproduction.
	Enzymes Digestion.
	Metabolism.

(*a*) Anatomy-Gross, minute and embryological, as far as possible, will precede the relevant teaching in Physiology.

(*b*) Bio-chemistry practicals will follow didactic teaching and as far as possible the classes precede or follow the relevant physiology sections.

(*c*) Clinical cases will be brought into the class-room wherever possible to illustrate clinical applications, *e.g.*, hernias (inguinal canal) endocrine disorders, anaemias, avitaminosis, dehydration, sub-protein clinical manifestations, etc. It is hoped such co-ordinated visual aids will help in integration of basic sciences with clinical disciplines.

3. For the three clinical years it was first agreed that the items mentioned below could be correlated by the relevant clinical departments, and the pre-clinical departments would be invited whenever and wherever possible.

1. Amoebiasis.
2. Anaemias.
3. Anaesthesia.
4. Anomalies.
5. Autonomic Nervous system.
6. Burns.
7. Congestive Cardiac Failure.
8. Dehydration.
9. Diabetes.
10. Diseases of the Skeleton.
11. Endocrines.
12. Fevers.
13. Growth and Development.
14. Growths and Malignancy.
15. Haemorrhage.
16. Hypertension.
17. Jaundice.
18. Nephritis.
19. Nutrition and Vitamins.
20. Oedema.
21. Paralysis.
22. Peptic Ulcer.
23. Peripheral Vascular diseases.
24. Pneumonia.
25. Psychosomatic diseases.
26. Pulse.
27. Rehabilitation.
28. Renal Calculi.
29. Shock.
30. Syphilis.
31. Trauma.
32. Unconsciousness.

These items could profitably be the subjects of symposia.

4. There are four academic terms before the 2nd M.B.B.S. examination when the clinical subjects could correlate wherever possible, with Pharmacology, Pathology and Forensic Medicine, somewhat as follows:—

I—TERM.

Introduction—

(*a*) The patient and his symptoms (medicine, surgery, Obst. and Gynaec. and Paediatrics).

(*b*) Water and Electrolytes.

Medicine	Fevers.
Pharmacology . . .	Anti-infectives.
Surgery	Splints, bandages, lotions, fractures, trauma, repair (Principles).
Public health . . .	Disinfectants.
Forensic Medicine . . .	Kinds and effects of Trauma.

II—TERM.

Medicine	Gastro-intestinal.
Pharmacology	(*a*) Antacids, (*b*) Nervous System.
Anaesthesia	General.
Surgery	Inflammations.
	Abdominal emergencies.
Preventive Medicine . . .	Water-food-gastro intestinal infections—Parasitology.
Pathology	Co-ordination.

III—TERM (IV YEAR, 1st Term).

Medicine	Cardio-vascular, Blood (Stress on Anaemias).
	Endocrines.
Obst. and Gynaec. . . .	Introduction.
	Abortions sterility.
Forensic Medicine . . .	Abortions sterility.
	Paternity Tests, etc.
Preventive Medicine . . .	Maternal and Child Welfare.
	Family Planning.
	Introduction to Geriatrics.
Pharmacology	Co-ordinating.
Pathology	

IV—TERM (IV YEAR, 2nd Term).

Medicine	Respiratory System.
	Tuberculosis.
	Genito-urinary.
	Hypertension.
Pharmacology	Chemotherapy of Diseases.
	Diuretics, Sera Vaccines.
Pathology	Co-ordinating.
Preventive Medicine . .	

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5. For the Final year, *i.e.*, after 2nd M.B.B.S. examination, we will make an attempt to co-ordinate what is left over in the clinical subjects.

APPENDIX 13

Improvement in Medical Education at the Topiwalla National Medical College, Bombay.

A beginning was made in these institutions in about 1953 in having a closer contact with the students. Accordingly, towards the end of 1953 and beginning of 1954, a large number of lecture-demonstrations compared to didactic lectures were arranged in Physiology and Pathology. The lecture-demonstrations were arranged in collaboration between the departments of anatomy and physiology for the purpose of integrating the subjects of anatomy, histology, physiology, bio-chemistry, etc. Reports of the students' progress were made every fortnight. Those students, remarks about whom were unsatisfactory, were interviewed by the Professors to find out and solve some of their difficulties and these students were separated out from the rest for greater attention being paid to them. Discussions on common topics were also arranged between the departments of anatomy and physiology where members of the staff of both the departments participated. Students were quizzed by putting up qustions of filling up gaps type, etc., at intervals, and reports were made every fortnight as stated above.

From the current term, *i.e.*, since June 1955, an attempt has been made to integrate the subject of anatomy and physiology. After a few preliminary lectures in these subjects covering anatomy, including histology and physiology including bio-chemistry in general, study of the cardio-vascular system was begun. Accordingly, one of the members of the anatomy department started with the regional anatomy of the thorax. Another member started with the study of the heart and blood vessels with special reference to function and microscopic anatomy. In the meantime, the Embryologist dealt with the development of the system. The members of the physiology department simultaneously dealt with the same system, *viz.*, cardio-vascular system. Histology was integrated with anatomy, physiology and histo-pathology, the latter only as an illustration for deviation for normal. As the cardio-vascular system was completed, the respiratory system was dealt with by the staff of the two departments in the same way stated above. Practical classes have been arranged and co-ordinated with the lectures. Arrangements were made with the Radiologist to demonstrate under the screen action of the heart, lungs, diaphragmatic movments, etc. He also demonstrated normal skiagram as well as a few abnormal ones to emphasise deviation from the normal structure. One of the Registrars from the medical department was also asked to demonstrate the normal physical signs and illustrate the physiological basis by demonstrations and abnormal physical signs of some cases as illustrations of deviation from normal regarding the two systems in the hospital wards. After the termination of these two systems, the elimentary system is being taken in the same way as others, again with the co-operation of the Radiologist and clinicians wherever necessary and possible to do so. It is proposed to continue the same method for genito-urinary system and the nervous system. Systems like osteology, endocrinology and autonomic nervous system which cannot be closely correlated are being dealt with separately by the departments. In this way, horizontal as well as vertical correlation has been attempted at the first M.B.B.S. stage.

Attempts are also being made to co-ordinate the teaching of pathology, pharmacology and forensic medicine. Common subjects are being dealt with wherever possible simultaneously by these three departments. Practical classes and dmonstrations are being held in forensic medicine with the co-operation of the other two departments of toxicology and medico-legal pathology. Clinico-pathological conferences are held, where in addition to the members of the clinical departments staff of the non-clinical departments are also asked to take part to throw light on the case from the point of view of their subjects.

Common clinical meetings for students where cases in medicine, surgery and gynaecology are held once in a fortnight. Students and various members of the staff take part in these discussions.

Co-ordination between the physicians and surgeons in the teaching of students during the junior clinical term has also been carried out. Two members of the medical and surgical departments have been placed in charge of one batch each for purposes of teaching. Here again, the teachers have been requested as far as possible to emphasise the basic anatomical and physiological principles in the study of clinical medicine and surgery, so that the sudden change from the basic departments of the college to the hospital is minimised.

Regular meetings (department-wise) are held every month to review the progress in the methods of teaching and to make changes or additions in the light of experience gained. The staff of the various units in the medical, surgical and gynaecological departments have been asked to co-ordinate their teaching work among themselves, so that any interesting case or material in any of the unit is brought to the notice of all the students in the same department though they may be working in different units. Didactic lectures have been reduced to the bare minimum and even these lectures are, as far as possible, lecture-demonstrations. It is not possible to do away entirely with all lectures in the clinical subjects. It is suggested that 10-15 lectures should be held for giving a general outline in the study of the disease-processes.

It is not, however, possible to bring these changes into full action for the following reasons:—

(1) insufficient number of staff;

(2) staff who have not been adequately trained in these systems of teaching;

(3) present system of examination whereby students are trained for the purposes of examination only and that too subject-wise.

The students working in the medical, surgical and gynaecological wards have started maintaining separate individual files wherein the case-notes written by them are filed. These notes are proposed to be checked by one of the members of the honorary staff at the end of every term and initialled. It is also suggested that the students may present these files at the examination to show the examiners the actual work done by them during their career in the hospital. For this purpose, the case-notes to be maintained in the hospital for record purposes are modified. This means, the present students' notes which are attached to the case papers and kept in the hospital would be maintained and taken by the students and the details of the notes maintained by the Housemen would only remain in the hospital record.

All the changes brought about at present are proposed to be reviewed at the end of the term to see what further changes and additions should be effected

APPENDIX 14

Appointment of Teachers

BY

DR. V. R. KHANOLKAR, B.Sc., M.D. (LOND.), BOMBAY.

There are four types of teachers concerned with education of medical students in this country, at present.

TYPE I.—Full time teachers of—

Non-clinical subjects (Anatomy, Physiology, Pharmacology and Pathology including Bacteriology).

TYPE II.—Part time teachers of—

(*a*) Forensic medicine.
(*b*) Preventive medicine.
(*c*) Infectious diseases.
(*d*) Mental diseases.

TYPE III.—Full-time (non-practising) teachers of clinical subjects.

TYPE IV.—Part-time teachers of clinical subjects.

Out of these the teachers in Type II are usually *ex-officio* members of the teaching staff, in virtue of their other appointments such as the Police Surgeon, Director of Public Health or City Health Officer, Superintendent (Infectious Diseases Hospital) and Superintendent, Mental Diseases Hospital.

As regards Type III there is a growing realisation in most universities that clinical subjects like Medicine, Surgery, Midwifery and Gynaecology can only be efficiently taught in special departments with a full time staff supported by part-time teachers. The charge of such departments is a full-time occupation. The duties of under-graduate and post-graduate teaching and guidance of research demand much thought and careful planning. Such work, besides the competent care and treatment of patients, has to be suitably distributed between full-time and part-time teachers. In most progressive universities the full-time members form the core or essential nucleus of these departments. They are responsible for the direct planning and distribution of teaching for research, and for administration of the department. Part-time officers carry out a fair proportion of clinical teaching and broaden the base of medical training by dealing with the human social and moral problems of diseases, which are so necessary in the development of 'complete physician'. I am convinced that a progressive development of education in this country can only be ensured if the work of these four types of teachers is continued, co-ordinated and properly canalised in the near future.

It may not be irrelevant at this stage to point out that the influences of the great advances made in educational science in recent years has not yet been felt in medical teaching institutions. An unbelievably small number of medical teachers have acquired or have even attempted to acquire the general background

of pedagogic theory and science. Almost any doctor feels that he is capable of teaching. Such teaching, however, on examination is found to consist of a racital of personal bedside experience.

It is not necessary to seek very far for the persons which are responsible for this almost complete lack of familiarity with modern teaching techniques. Most medical teachers are not interested in teaching as such. Their motives for seeking academic appointments are often questionable and constitute a means to an end, which is not teaching as a science *per se*. It very often is concerned with the kudos of a university teaching position or a hospital staff appointment. The concern of most medical teachers in seeking an academic post includes such ends as opportunity for research, accessibility to a quantity and variety of clinical materials, records and physical facilities not ordinarily available to non-teaching institutions, the opportunity to make frequent professional and social contacts of a stimulating character, the enhancement of self esteem, authority and prestige, economic security, or in the case of some part-time teachers command of higher professional fees, the circumvention of certain unpleasant aspects of private practice and similar determinate of action. For such individuals teaching constitutes an unwelcome but necessary chore—the staff they must handle in order to obtain the desired wheat. Accordingly, it receives a minimum of attention, time, planning and effort at continuous personal improvement.—(*Russell Mayers.*)

The question of appointment of teachers comprises of two different components:—

1. Slaboration of suitable machinery for the recruitment of teachers.
2. Formulation of the necessary qualifications which should provide a basis for their selection.

1. MACHINERY FOR THE RECRUITMENT OF TEACHERS

Until very recently, almost all medical colleges in India were Government institutions and the teachers were selected by the Surgeon-Generals of the Provinces. The appointments in non-clinical subjects were usually stepping stones to clinical appointments, with their big rewards and much prestige. The teachers, except in rare instances, had received no previous training, nor were they always interested in teaching the subjects for which they had been appointed. This state of affairs has been greatly changed during the last 25 years. The selection of teachers has now devolved on a more or less independant organisation, the Public Service Commission, whose members are believed to be impervious to local influences and political pressure. On the face of it, such a system has everything to commend it. Unfortunately, practical experience has shown it to be very unsuitable for appointments in scientific and medical subjects. Members of the Public Service Commission are men of great merit and considerable rectitude, but their acquaintance with scientific and medical subjects is woefully inadequate. They are therefore guided in the discharge of their functions by two administrative devices (i) a comparison of the record of the candidates in examinations from the time of their Matriculation, and (ii) a guidance by an 'expert' from the medical or corresponding department. Anyone who has had an experience of university examinations is conscious of the utter unreliability of examination results for assessing a person's initiative, scholarship and aptitude. Persons who have given this matter much thought in this country and outside it have realised that examinations can at best be looked upon as crude guides in these respects but could certainly not be taken as quantitative determinants in matters of selection.

As regards the expert, who is generally asked to advise the Public Service Commission, it is the usual practice to nominate the Director of Health Services in the State, his substitute or the Head of a medical college or institute for this purpose. Very often, a person of this type has been out of touch (if he had ever been so qualified) with recent advances in the particular medical subjects, medical education and medical research. This difficulty is so obvious that in most modern countries outside India an "Electoral College" of the universities undertakes this function. They comprise mainly of teachers who are actively engaged in imparting instruction in the subject under consideration, assisted by one or more administrators. I may be permitted to quote a sentence in this connection from the Goodenough Committee's Report—"We consider that for the vigorous growth of the teaching centres upon which ultimately the successful operation of the health service depends, the selection machinery for any teaching centre must be constituted primarily for that Centre, by the educational and other interests of the Centre, and with due regard to its tradition, the policy and the dual interrelated functions of caring for the sick and of providing medical teaching and research."

I am therefore of the opinion that a Selection Committee of the lines of the electoral colleges in some foreign universities or a Committee consisting of one member of the Public Service Commission and two or more eminent teachers in the subject for which the appointment is to be made would probably constitute a most satisfactory selecting machinery.

It might be objected that members of such a Committee would be more amenable to extraneous pressures in matters of selection than a statutory body like the Public Service Commission. It has, however, to be realised that no system which human ingenuity has so far devised has succeeded, if integrity and inspiration be lacking in persons who are called upon to work it. It is possible that, with the assumption of greater responsibilities, our people will learn to eschew nepotism, communalism and provincialism.

2. NECESSARY QUALIFICATIONS FOR MEDICAL TEACHERS

As regards the essential qualifications which should be expected in persons aspiring for teaching appointments, it should be borne in mind that "an ability to convey knowledge and to stimulate the thought processes of another individual is, to a general extent an inherent quality. Those with such ability enjoy its application".—(*J. F. Rinehart*). If we wish, therefore, to keep abreast of medical problem in our teaching institutions, we must apply faithfully and rigorously the principles which we may lay down for our guidance. It is, therefore, suggested that in the selection of persons for professorial posts the following three qualifications should be carefully looked for, weighed and compared during the process of assessing the suitability of the aspirants for any given appointment:—

(1) Ability to convey knowledge.

(2) Possession of post-graduate attainment.

(3) Proved ability for carrying out or guiding original work.

In some countries as in Sweden and Spain the candidates are assigned a subject or subjects to prepare and teach them to student in the presence of the assessors and an adequate consideration is accorded to the manner or presentation, originality of thought and clarity of expression.

The insistence on research needs a little explanation. If medical instruction consisted only of dispensing accumulated human knowledge to students such a requirement would be unnecessary. Under such conditions the need for professors interested in research would be superfluous of even wasteful. Experience has however shown that instruction in most fields of learning thrives best in places where the original stimulus for research is most active. The conjunction of teaching and research in the same department has shown itself in the past and will continue to do so in future, a very fruitful measure for advancement of human thought. ".Many advantages accrue to the University Professor or instructor who indulges in medical research. In the first place, being a teacher, he must learn widely and have a good general knowledge of his subject. He is not limited in his learning by the fact that for commercial or other reasons, he must confine his attention to a relatively narrow field of study. Wide general knowledge of a subject, coupled with specialised and detailed information one or more fields within that subject, offers definite advantage . . . . It is the duty of the university professor or instructor to learn widely the subject-matter of the department concerned, bcause universities form part of our educational system, the primary function of which is to teach. But all professors are good teachers, very few are excellent teachers. The ability to teach well is an art which in its fullest extent, is given to but few . . . . The teacher who can inspire even some of his students with a desire to learn more and understand more and to search into the unknown when and as time permits has arrived at the pinnacle of teaching art."—(*B. M. Boyd.*)

Before concluding, it is necessary to point out that in any system which may be adopted in future there are three considerations which may be constantly kept in mind:

(1) The selecting and appointing authorities should enjoy a large measure of flexibility, in the manner and sequence of appointments, to the staff of the medical colleges. At present the dead weight of certain administrative departments leads to the filling up of posts, even when persons of requisite distinction are not available.

(2) The promotion from a lecturer, reader or assistant professor to the post of a professor in the same institution should be discouraged, as far as possible. This was the practice in most German Universities and had very salutary results, in as much as it prevented an inbreeding of ideas and arrangements, in any given department and fostered cross fertilisation of concepts and methods. Such promotion however desirable it may be in the administrative departments often leads to a deterioration of new and original thought, as the assistants tend to follow in the furrow traced by the master and strive to imitate and continue his teachings.

(3) A permanent tenure of service has many reasons for commending it. A sense of security is believed to ensure a peace of mind, requisite for good teaching and research. It is unfortunately also true that a teaching appointment when once secured often leads to a feeling that it is a sinecure and curtails most of the initiative and incentive to original work. It is not the intention to suggest that security be replaced by insecurity, but that security be made in a sense relative. Biologically speaking, life in all its varied manifestations is a struggle for existence. Now this struggle is not really a disadvantage. It adds most to life. "When one feels secure in a particular

post, there is always the danger that some at least of them urge to struggle, to get ahead, to accomplish, to do things may be lest."—(*Boyd.*) In order to combat this tendency to smugness and security in a permanent appointment, a system of five year tenure renewable on commendable performance is a matter worth careful consideration. The adoption of such a policy would, to a great extent, keep a professor intellectually alert instead of allowing him to settle down on a stagnant bed of obsolete and archaic ideas. "There is no sadder picture than the professor who has outgrown his usefulness, and the only one 'unconscious of the fact, insists, with a praisworthy seal, upon the performance of duties for which circumstances of the time have rendered him unfit. When a man nor wax or honey can bring home, he should, in the interests of an institution be dissolved from the hive to give more laborers room, though it is not every teacher who will echo the sentiment'." —(*Osler.*)

ANNEXURE

TO

REPORT OF SUB-COMMITTEE II AND ITS STUDY GROUPS

NOTES ON :—

(1) Curriculum—General Principles.

(2) Electives.

(1) CURRICULUM—GENERAL PRINCIPLES

While framing the curriculum, the following considerations were before the Sub-Committee:—

(1) Development of a preventive point of view in medical practice.

(2) Creation of interest and understanding in the mind of a student about specific health and disease problems in villages of rural India, through his exposure to rural condition, during undergraduate education.

(3) Midwifery training and experience to meet emergency requirements in rural communities.

(4) Need of ability for diagnosis without elaborate equipment.

(5) Competence in simple surgical techniques.

In order to meet the requirements suggested above, the Committee felt

In order to meet the requirements suggested above, the Committee felt

that their aim could be fulfilled by introducing in the methods of teaching:—

co-ordination, co-operation, and planning.

(2) Teaching of Preventive Medicine on a new oriented plan. This plan should consist of an understanding of

(*a*) man as related to environment.

(*b*) a wider understanding of causes of disease processes in the man and the environments.

(*c*) actual field surveys—visits to rural and urban areas.

The teaching of preventive medicine as conceived above could be done

(*a*) by reorientating the teaching of pathology and its allied subjects including social pathology, psycho-pathology, etc., and even by increasing the time of teaching in these subjects and integrating this teaching with the teaching of preventive medicine,

(*b*) by introducing field surveys and training in rural and urban areas, and also by domicillary visits to the families for health and care programme.

It was found that the time of teaching of different subjects as in vogue in different medical colleges showed a very wide variations *vide* table given below:

Subject	At present hours			Adjustment	Now proposed
	Min.	Max.	Average		
Anatomy Embryology Histology.	635	1,914	1,142·8	—642·8	500
Physiology Biochemistry .	249	748	400·0	+100	500
Pharm acology Toxicology .	131	314	244·0	—44	200
Pathology Bacteriology Parasitology Forensic Medicine.	192	648	420·5	+79·5	500
Medicine Pediatrics Anaesthesia T. B. Leprosy Skin, Mental diseases Inf.diseases	1,026	1,295	921·4	—21·4	900
Preventive Medicine . .	50	238	114	+276	390
Surgery Orthopaedics E. N. T. Ophthalmology Dental Medicine Anaesthesia.	710	1,100	1,076·1	—276·1	800
Obstetrics Gynaecology .	350	538	326	+74	400
TOTAL .	3,343	6,795	4,644·8	—454·8	4,190

1. Huge amount of time in teaching of Anatomy as seen from the table as at present has no justification with improved methods, this time could be cut down to 500 hours.

2. Increase of teaching time in Physiology is recommended to stress the growing importance of Bio-chemistry.

3. The hours of teaching Pharmacology could be reduced by integrating the teaching of Physiology and Pharmacology.

4. With the new concept of putting emphasis on the teaching of preventive and social medicine, Pathology and its allied subjects will have to be taught by collaboration with preventive medicine, social medicine and psychiatry on the one hand and with general medicine on the other hand. Hence the teaching hours in Pathology should be increased.

5. The time of teaching clinical medicine is maintained as at present.

6. The time of teaching preventive medicine is increased. The increase, though seemingly enormous, is necessary. The field surveys, the visit to ante-natal clinics and families and the consequential follow-up would consume much time. And even with this increase the field work done by each student would be just sufficient to understand the man, his biological nature and his relationship with environment.

   A student will also be introduced to various factors for (i) Maintenance of health, (ii) preventive measures at different levels, (iii) to the public health aspects including measures and participations in immunization programme, etc.

   The time allotted is not too much.

7. The time of teaching surgery and its allied subjects has been drastically cut down. It was felt that the needs of a basic doctor are that he should know the basic principles of surgery. He need not know the complicated surgical operative technique and other highly specialised procedure in its specialities. Hence the time cut from surgery was transferred to preventive medicine.

8. Growing importance of midwifery made in Committee to allot a little more time to this subject.

The Committee thought during the first year there would be available 1140 hours for instruction and 5,130 hours in four and half years.

The Sub-Committee No. 2 had recommended that the time corresponding to 25 per cent. of the total time available for instruction be set apart for elective studies at the choice of the students. After some discussion the joint Committee recommended about 83 per cent. of the total time for formal instruction and about 17 per cent. for elective studies

Assuming there are 34 working weeks in a year, analysis of hours of suggested curricula would be as under:

During	Total available hours	Per week hours: Instruction		Electives	
1½ years of pre clinical period	30	24	80%	6	20%
1st clinical year	35·3	30·3	85·9%	5	14·10%
2nd clinica lyear	35·3	29·4	83·3%	5·9	16·70%
3rd clinical year	35·3	27·4	77·7%	7·9	22·30%

(2) ELECTIVES

Objectives :

With the introduction of new methods of teaching, as outlined in the Report, the student is expected to get an integrated concept of the most important principles of medical science, supplemented by an amount of detail commensurate with his intellectual capacity and by the ability to relate his knowledge always to fundamental principles and to the patient as a whole.

It would be further desirable to give him opportunities to develop the ability to reason critically and to apply this ability towards the logical solution of the problems which arise throughout his career. These opportunities, if designed with care, would help a student to gain maturity, motivation and sense of responsibility.

These qualities could develop if a student accepts the responsibility for his own education in a medical school.

Plan :

Self-education by a student can be facilitated if free time is given to him outside the time-table for his formal studies. The report allots 25 per cent. of the total time available for total studies, for the pursuit of such studies which a student may, by his free choice, undertake. The essential feature is the freedom for the student to pursue those methods of self-education which he finds most effective in promoting his intellectual growth. In this activity, the faculty members should act as tutors. A tutor should serve as an advisor, a colleague and a friend, but not as a school-master, a boss, a policeman or a judge.

Electives may be of the following nature:—

(1) Performance of additional experiments.

(2) Repetition of classical experiments.

(3) Reviews and Library reference.

(4) Elective courses which may clear up some deficiency in the students background.

(5) Advancement of knowledge in some special field of interest.

(6) Research—

(*a*) Non-clinical subjects.

(*b*) Clinical subjects.

(*c*) Autopsy studies.

(*d*) Participation in field or research activities conducted in any of the college or hospital departments sponsored by the university or recognised Research Organisations such as Indian Council of Medical Research.

(7) Study of non-medical subjects which have aroused his intellectual curiosity, but which have a bearing on medical education.

SAMPLE OF ELECTIVE STUDIES

Medical Physics

Yale University :

(1) Seminar.
(2) Research.

Anatomy

Yale University :

(1) Demonstration in Anatomy.
(2) Introductory human Embryology.
(3) Advanced Embryology (open to students with basic knowledge of Embryology).
(4) Philosophy of the organism.
(5) Medical Terminology for History of Anatomy.
(6) Reconstruction of Nervous System.
(7) Functional Anatomy of the Nervous System.
(8) Comparative Neurology.
(9) Neurological Seminar and Seminar Club.
(10) Anatomy of new born.
(11) Genetics.
(12) Endocrionolgy of Reproduction.
(13) Organs of Special Senses.

T.Y.

(14) Seminar.
(15) Research.

T.Y.H.

(16) Topographic and cross sectional Anatomy.

T.Y.

(17) Analytical Cytology.

Johns Hopkins University :

(1) Surgical Anatomy. Applied Anatomy.

H.T.

(2) Peripheral Nerves. H.
(1) Regional Anatomy.

T.

Physiology.

Yale University :

(1) Physio-chemical basis of General Physiology.
(2) Normal and abnormal Physiology of circulation.
(3) Biophysical Chemistry.
(4) Research in Physiology.
(5) Seminar in Mammalian Physiology.
(6) Seminar in General Physiology.

Physiological Chemistry.

Yale University :

(1) General Biochemistry.
(2) Advanced Phsiological Chemistry.
(3) Special aspects of Amino Acid and Protein Chemistry.
(4) Advanced Practical Biochemistry.
(5) Seminar.
(6) Research.
(7) Isotope Techniques.

Johns Hopkins University :

(1) Biochemical Preparation and Technique.
(2) Chemical Pathology.
(3) Seminars.
(4) Research.

Nutrition.

Yale University :

(1) Nutrition in Public Health.
(2) Physiological function of the Vitamins.
(3) Recent Developments in Nutrition.
(4) Laboratory techniques in Clinical Nutrition.
(5) Research in Nutrition.

Pharmacology.

Yale University :

(1) Chemical Pharmacology.
(2) Clinical and Industrial Toxicology.
(3) Seminar.
(4) Toxicology, Chemistry of Poison.
(5) Experimental Biometrics.
(6) Special methods in Research.
(7) Applied Biological Assay.
(8) Medical Biometry.
(9) Relation of chemical structure to the action of drugs.
(10) Basis of Anaesthesia.

Johns Hopkins University :

(1) Bacterial Metabolism and Chemo-therapy.
(2) Advanced Work and Research.

Pathology.

Yale University :

(1) Post-mortem Analysis of the Disease.
(2) Research in Pathology.
Investigation—
Experimental.
Statistical.
Descriptive.
(3) Pathology from the Standpoint of Chemistry.
(4) Analytical Cytology (Anatomy).
(5) Gynaecological Pathology.

Johns Hopkins University :

(1) Advance Work and Special Research.
(2) Medico-legal Pathology.

Tumours.

Yale University :

(1) Tumour Conference.
(2) Neoplastic Surgery.
(3) Practice in Turn.
(4) Advanced Oncology.

Johns Hopkins University :

(1) Tumour Clinic.

Microbiology.

Yale University :

(1) Medical Mycology.
(2) Experimental Virology.
(3) Host-parasite Relationship.
(4) Pathogenic Protosoology.
(5) Immune Chemistry.
(6) Seminar.
(7) Advanced Microbiology.

Johns Hopkins University :

(1) Diagnostic Bacteriology.

Internal Medicine.

Yale University :

(1) Allergy Clinic.
(2) Disease of Metabolism.

INTERNAL MEDICINE—*contd.*

(3) Heart Disease.
(4) Syphilis.
(5) Tuberculosis.
(6) Clinical Tuberculosis.
(7) Cardiac Clinic.
(8) Electro-Cardiography.
(9) Haematology.
(10) Gastrooenteriology.
(11) Research.
(12) Clinical Dermatology.
(13) Problems in Haematology.
(14) Recent advances in Cardiovascular Research.
(15) Cardiopulmonary Physiology in Clinical Medicine.
(16) Clinical Hypertension.
(17) Arthritis.

Johns Hopkins University :

(1) Haematology.
(2) Clinical Haematology.
(3) Parasitology.
(4) Venereal Disease.
(5) Diseases of Stomach and Intestine.
(6) Diseases of Lungs.
(7) Medical Dispensary.
Protein Sensitization.
Diabetes.
Cardiac Disease.
(8) Clinical Electrocardiograph.
(9) Allergy.
(10) Chemical Pathology.
(11) Physiology in Medicine.
(12) Disease of the Liver.
(13) General Principles in the use of Nuclear Isotopes.
(14) Application of Isotope Tracer Techniques.
(15) Cardio-vascular Study.
(16) Ward Medicine.
(17) Seminars in Experimental Cancer Research.
(18) Cardio-vascular Diseases.
Cardiac Conferences.
Clinical Cardiology.
(19) Essentials of Dermatology.
(20) Practical work in diseases of Nervous System.
(21) Pathology of Nervous Diseases.
(22) Neurological Pathological Conference.

CLINICAL MEDICINE.

Clinical Clerkship.

Yale University :

(1) Medicine.
(2) Surgery.
(3) Psychiatry.
(4) Radiology.

Cardiology.

Yale University :

(1) Normal and abnormal Physiology of Circulation.
(2) Heart Disease.
(3) Cardiac Clinic.
(4) Electro-cardiography.
(5) Cardiac Clinic.
(6) Diagnosis and treatment of—
Cardio-vascular and Peripheral Vascular Disease with emphasis on fundaments of patient care.

Preventive Medicine.

Yale University :

(1) Principles of Epidemiology.
(2) Experimental Virology.
(3) Arthritic Clinic.
(4) Research.

Public Health.

Yale University :

(1) Principles and Practice of Public Health.
(2) Principles of Vital Statistics.
(3) Elementary Biostatistics.
(4) Medical Biometry.
(5) Methods of Statistical Analysis.
(6) Practical field work in Public Health and Medical Care.
(7) Public Health Seminar.
(8) Physiological Hygiene.
(9) Elements of Sanitary Engineering.
(10) Sanitation of the Environment.
(11) Public Health Education.
(12) Medical Care.
(13) Problems of Medical Care Administration.
(14) School Health.
(15) Basic Educational Issues.
(16) Public Health Nursing.
(17) Health Administration.
(18) Principles of Epidemiology.
(19) Maternal and Infant Health.
(20) Medical Jurisprudence.
(21) Nutrition in Public Health.
(22) Public Health Law.
(23) Psychiatry in relation to Public Health.
(24) Medical care in Modern Society.
(25) Hygiene of Housing.
(26) Public Health Engineering Design.
(27) Hospital Clinics.

Child Health Centre.

Yale University :

(1) Child Development.

Paediatrics.

Yale University :

(1) Technique of Clinical Bacteriology.
(2) Infectious Diseases.
(3) Cardiac Clinic.
(4) Infant Welfare Conference.
(5) Children Metabolism Clinic.
(6) Research.
(7) Hematology.
(8) Childrens Neurology Clinic.
(9) Childrens Allergy Clinic.

Johns Hopkins University :

(1) Outpatient Department.
(2) Special Clinics.
Cardiac Diseases.
Pulmonary Diseases.
Epilepsy.
Endocrine Disorders.
Allergic.
Premature and New-born Infant.
Diabetes.
(3) Paediatric Radiological Conferences.
(4) Staff Conferences.

Surgery.

Yale University :

(1) Neurosurgery.
(2) Neurosurgical Clinic.
(3) Diagnosis—treatment of Sketetal Trauma.
(4) Neoplasia.
(5) Urology.
(6) Surgical Disease of the Chest.
(7) Anaesthesia.
(8) Plastic Survery.
(9) Dental Surgery.
(10) Surgical Pathology of Bones.
(11) Disease of the Ocular Fundus.
(12) Extra Ocalar Muscular Defects.
(13) Diagnosis and treatment of Cardio-vascular and Peripheral Vascular disease with special emphasis on fundamentals of patient care.
(14) Demonstration of refraction examination.
(15) Audiology.
(16) Investigation work.

SURGERY—*contd.*

(17) Opthalmic surgery problem.
(18) Recent advances in Surgery.
(19) Introduction to Otolaryngology.
(20) Introduction of Ophthalmology.
(21) Clinical Medicine Clerkship.

Johns Hopkins University :

(1) Plastic Survery.
(2) Rectal Surgery.
(3) Operative Surgery.
(4) Surgical Pathological Conference.
(5) Clinical Anaesthesiology.
(6) Surgical Therapeutic Ward Rounds.
(7) Hernia.
(8) Neurological Surgery.

ORTHOPAEDICS.

Johns Hopkins University :

(1) Orthopaedic Surgery.
(2) General operating room.
(3) Anatomy and Biomechanics of the Axial Skeleton.
(4) Special Work.

OBSTETRICS AND GYNAECOLOGY.

Yale University :

(1) Gynaecological Pathology.
(2) Variation of Bony Pelvis in relation to Obstetrics.
(3) Research.

Johns Hopkins University :

(1) Gynaecological Pathology.
(2) Outpatient Clinics.
(3) Practical Obstetrics.
Clinical Clerkship.
(4) Staff rounds and Conferences.
(5) Investigation.

OPHTHALMOLOGY.

Johns Hopkins University :

(1) Ward Rounds.
(2) Dispensary Work.
(3) Refraction and Myology.
(4) External Diseases and Routine Therapeutic Procedure.
(5) Orthoptic Training.
(6) Pathology of the Eye.
(7) Special Bacteriology and Immunology of the Eye.

(8) Ophthalmic Neurology.
(9) Medical Ophthalmology.
(10) Anatomy and Elementary Physiology of the Eye.
(11) Clinical Pathological Conference.
(12) Advanced Physiology and Chemistry.
(13) Physiological Optics.

RADIOLOGY.

Yale University :

(1) Diagnostic Roentology.
(2) Clinical Clerkship or Research.
(3) Introduction to X-Rays and Radio-isotopes.
(4) Physics of X-Rays.
(5) Biological application of Nuclear Physics.
(6) Clerkship.

Johns Hopkins University :

(1) Problems of Radiological Diagnosis and Therapy.
(2) Paediatric Radiological Conference.

PSYCHIATRY.

Yale University :

(1) Psychopathology.
(2) Student Internship.
(3) Forensic Psychiatry.
(4) Organic Problems in Neuro-Psychiatry.
(5) Psychiatric Prophylaxis and Rehabilitation.
(6) Family Dynamics.
(7) Psychiatric Training.
(8) Psychiatry and Law.
(9) Analysis of the Child.
(10) Preschool Child.
(11) Child Psychiatry.
(12) Advanced Seminar.
Faculty Members.
(13) Advanced Pscho-analytic Seminar.
Faculty Members.

Johns Hopkins University :

(1) Medical Psychology.
(2) Practical Clinical Examination.
(3) Outpatient Work.
(4) Clinical Psychiatry and Psychotherapy.
(5) Pathology and Therapy and Psychiatry.
(6) Psychobiology and Psychopathology.

Neurology.

Yale University:

(1) Basis of Neurology.
(2) Philosophy of Organism.
(3) Reconstruction of Nervous System.
(4) Functional Anatomy of Nervous System.
(5) Comparative Neurology.
(6) Neurological Seminar and Journal Club.
(7) Organic Problems in Neuro-psychiatry.
(8) Neuro-surgery.
(9) Neuro-surgical Clinic.

Urology and Otolaryngology.

Johns Hopkins University:

(1) Dispensary Course.
(2) Major Course.
(3) Bronchoscopic Course.
(4) Anatomy and Pathology of the Ear.
(5) Research in Otology.
(6) Aural and Speech Rehabilitation.

History of Medicine.

Yale University:

(1) Introduction to the History of Medicine.
(2) Medical Terminology and History of Anatomy.
(3) Use of the Library.
(4) Medical Bibliography.
(5) Origin of Public Health Movement.
(6) History of Physiology.
(7) History of Obstetrics.
(8) History of Eponymic Disease Entities.
(9) Medicine in the 19th Century.

Johns Hopkins University:

(1) Outlines of History of Medicine.
(2) History of Public Health in U.S.A.
(3) Use of the Library.
(4) History of Medieval Medium.
(5) History of Anatomy.
(6) History of Pathology.
(7) History of Modern Science.
(8) History of American Medicine.
(9) Seminar in History of Science.
(10) Seminar in Medical Bibliography.
(11) Problem of Chinese Medicine.

APPENDIX II(3)

REPORT OF THE SUB-COMMITTEE (NO. III) ON "EXAMINATIONS".

MEMBERS OF THE COMMITTEE.

1. Dr. M. N. Sarkar,
   Principal,
   Calcutta Medical College,
   Calcutta.

2. Dr. P. V. Gharpure,
   Emeritus Professor of Pathology,
   Pathology School,
   Grant Medical College.
   Bombay.

3. Dr. C. Raghavachari,
   Professor of Surgery,
   Stanley Medical College,
   Madras.

4. Dr. K. L. Wig,
   Principal,
   Medical College,
   Amritsar.

The Committee was given the task of examining the whole system of examinations and making suitable recommendations in all aspects of the problem. The Committee issued a very comprehensive questionnaire with a view to ascertain the existing practices and also to elicit opinion of some of the important points concerning them. The Committee's findings are summarised below:—

(1) The present system of examination was not considered satisfactory from the point of view of assessing the merits of candidates;

(2) The Committee noted that the failure rate in examinations tended to be abnormally high and drastic remedies were needed to improve the situation. In the opinion of the Committee the following factors were responsible for the above state of affairs:—

(*a*) Improper selection of candidates for admission to medical colleges;

(*b*) Inadequacy of trained staff for teaching purposes, the student-teacher ratio being abnormally disproportionate;

(*c*) Tendency on the part of students to memorise textbooks and devote less attention to practical work either in the laboratories or in the wards ; and

(*d*) Adoption of varying standards by Examiners coming from different Institutions.

The Committee wished to emphasise that in order to remedy these defects emphasis should lay where it belonged, *viz.*, on pre-medical and medical studies and to the selection of right type of students to the medical course. The Committee also wished to state that the methods of imparting instruction to the students needed revision. These points were not discussed in detail by the Committee since that did not fall within their terms of reference.

In making recommendations to remedy the situation noted above, Committee considered the question whether it was possible to eliminate examinations altogether and devise other methods for the assessment of students from the point of view of their proficiency to follow the medical profession.

The Committee felt that—

(1) while there was no system of examination which was really infallible, there was no other satisfactory method which could replace examinations as the best device for the assessment of students to practise the profession ;

(2) examinations, at any rate, acted as a spur to students to study.

The Committee noted, however, that there was need to shift the emphasis from 'examination' to 'training' by giving special credit to class work. While the Committee was generally in favour of devising ways and means to assess the class work of students periodically, it wishtd to point out the dangers and difficulties which might be encountered in introducing such a system.

They were—

(i) Inadequacy of adequately trained staff to supervise the work of students ;

(ii) The danger of delegation of responsibility in this matter to junior members of the staff not yet competent to shoulder it ;

(iii) Possible dangers of bias, favourtism, prejudices, etc. ;

(iv) Varying standards that might be introduced in different institutions.

Notwithstanding the above mentioned dangers and difficulties, the Committee was strongly of the opinion that the introduction of assessment of class work in some form was necessary and that it should be introduced gradually within a maximum period of ten years. As an ultimate objective, the Committee felt that 50 per cent. of marks should be allotted to class work in the final assessment of students' performance. In assessing the class work the following should receive specific attention:—

(i) Record of work in Laboratories ;

(ii) Record of work in the Hospital (case sheets) ;

(iii) Results of examinations held at unspecified periods during the course of training ; and

(iv) Terminal examination including multi-choice type of examination of facilities for the purpose are available.

In the final assessment of the students a scheme on the lines adopted in the University of Travancore is suggested, for example:—

	Marks.	Minimum required for pass.
Written (University)	100	45
Average of class tests	100	40
Oral (University)	50	40
Total . .	250	125
Practical and/or Clinical (University) . .	100	45
Practical Records or case sheets . . .	100	40
Total . .	200	85

The unspecified tests and the terminal (Sessional Examination) proposed above may take the place of average of class tests and make for the Records and Case Sheets as in the Scheme above.

The above scheme of giving credit to class work, it is hoped, will ensure the students showing a sustained interest in their training and will prove to be the right way of shifting emphasis from the examination to the training.

SCHEME OF EXAMINATIONS

(a) *Number and Spacing*:—The first examination should be held at the end of a year and a half or two years from the date of admission into a college. The subjects for the examination shall be Anatomy, including Embryology and Histology and Physiology including Biochemistry.

The second examination should be taken one and a half year after the first. The subjects for this examination should be Pathology (General), introduction to Bacteriology and elementary Parasitology and Pharmacology including Toxicology.

The subject of Medical Jurisprudence is recommended to be divided into Toxicology and Forensic Medicine, Toxicology should be included in the Pharmacology examination.

The final examination should be at the end of three years after passing the first examination, the subjects being Medicine, Surgery, Obstetrics and Gynaecology. Medicine should include Social and Preventive Medicine and Paediatrics; Surgery should include Ophthalmology.

There should be no University examination after passing the final examination, during the preregistration internship or at the end of the internship.

With the exception of paediatrics and ophthalmology, as many specialities in the subjects of Medicine and Surgery as may be possible, be relegated to class examinations. So far as Medical Jurisprudence (legal medicine) is concerned, a student should be examined departmentally during the course of preregistration training.

(b) *Place of Written, Oral and Practical Examinations.*—The examinations at present are being carried out under three sections, namely: Clinical and/or

Practical, Oral and Written. This system should continue for the present. It is, however, suggested that the importance given to the written part be gradually reduced. The advisability of adopting the system of multiple choice of questions (quiz) was discussed. It was not thought advisable to introduce it at the University level, but it was recommended to be used for College class examinations.

The utility of oral examination was unanimously agreed upon. Such an examination should consist mainly of questions on specimens, skiagrams, ECG, appliances, etc. The marks obtained at the oral examination should be added to those of the written. This is intended to help those students who cannot express themselves well in written papers ; it will also give the examiner an opportunity to find out the real ability of a student. However, not more than 30 per cent. of the aggregate marks in the subject should be set apart for the Oral Examinations.

The present system of clinical examinations should continue with the proviso that the Clinical examination must be purely clinical, with discussions relevant to the case before the candidate, and not used as a stage for purely theoretical examination. To maintain the importance of the clinical examination a minimum of 50 per cent. of marks must be obtained in that examination for a pass in that subject.

Appropriate importance should be given to the examination on short cases. The practical examinations should be purely practical. All oral discussions should be avoided. In the Anatomy practical examination a candidate may be asked to do dissections, but that should not be compulsory. Similarly in Physiology, experiments on frogs may be omitted and more stress be laid on Biochemistry and human Physiology.

(c) *Credits.*—In all the examinations a minimum of 50 per cent. shall be obtain for a pass. We further recommend that there should be an introduction of a class system, *i.e.*, the student who gets 66 per cent. should be placed in the first class and the rest in class two. A first class should be given to those candidates who take all the subjects of an examination at the same time and pass at the first chance. We do not recommend the adoption of any system of grace marks. Besides the introduction of this class system, any candidate who gets 75 per cent. or more marks should get distinction in that subject, provided he passes all his subjects of the examination at the first chance.

(d) *Conduct of Examination.*—Whenever it is possible, half the number of examiners should be internal and half external. The papers should ordinarily be set by both internal and external examiners jointly. In order to secure an adequate number of external examiners we suggest that examination dates be fixed suitably by some inter-University Organisation at least regionally.

We recommend that a student should be examined in the environment in which he was trained.

As far as possible an Examiner should be one who is engaged in teaching the particular subject in which he is appointed. Retired teachers or *ex*-teachers may be employed as examiners within three years of the event of retirement or leaving the teaching job.

Fees for examinations should not be lowered at the cost of lowering the remuneration of an examiner. To get suitable persons to act as examiners remuneration should be sanctioned to provide reasonable comforts and a suitable means of transport to the examiners.

APPENDIX III (1)

MEDICAL EDUCATION IN SOUTH-EAST ASIA

AN ANALYTICAL STUDY

Based on the reports and observations of W.H.O.
Consultants and Staff
1952-53

W.H.O. Document SEA/RC7/5, dated 25th July, 1954.
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APPENDIX III(1)

INTRODUCTION

In the past three years the Regional Office for South-East Asia, in close co-operation with Headquarters (Division of Education & Training Services), made a concerted effort to assist governments in improving standards of medical education. In the majority of the countries of the Region major education and training projects were implemented to that end which brought a considerable number of highly qualified foreign teachers into contact with numerous medical educational institutions and with great numbers of their teaching staffs. The number of consultants on whose reports this study is largely based totalled 34. They were recruited from 12 different countries (1) in which they occupy important teaching positions and most of them were internationally recognized authorities in their respective fields. They represented 17 different specialities in the basic medical, clinical, and public health sciences (2) and spent an approximate total of 73 consultant months in the Region. Most of the consultants were engaged on short-term assignments (usually for two months) at a time, however, a number of them had been engaged repeatedly and their experience in the Region was thereby correspondingly longer. Many of the consultants employed have had varied previous experience in countries other than their own and some of them have had the benefit of long academic careers in the South-East Asia Region specifically. (3) All of these consultants rendered reports on their activities and observations containing recommendations as to steps to be taken to improve teaching and practice in their respective specialities. The total of these voluminous reports add up to a survey of medical education in the Region which somewhat differs from the ordinary survey inasmuch as survey was not, as a rule, the primary function of these consultants. They spent most of their time actually working in the departments on which they reported and thereby had an opportunity to gain a somewhat deeper insight into the problems than is possible to the mere on-looking observer.

Besides the reports of the above mentioned consultants, WHO Secretariat staff could draw on first-hand experience of its own. The Regional Director at New Delhi keeps in close touch with all relevant developments in the area through his Area Representatives, stationed in the various countries of the Region. and also has a Regional Adviser for Education and Training on his staff, and finally, personnel from Headquarters Division of Education and Training Services (the Director of the Division and the Chief of the Exchange of Scientific Information Section) have spent a total of nine months of field work in the Region in the last two years.

(1) Belgium, Canada, Denmark, France, Holland, India, Italy, Norway, Sweden, Switzerland, United Kingdom, and United States of America.

(2) Biochemistry, Physiology, Pharmacology, Microbiology, Pathology, Internal Medicine, Paediatrics, General Surgery, Thoracic Surgery, Orthopaedic Surgery, Otorhinolaryngology, Anaesthesiology, Radiology, Public Health Administration, Preventive Medicine and Epidemiology, Nutrition, and Sanitary Engineering.

(3) For list of consultants, see Annex.

The present document, which is essentially an analytical and critical study of the so accumulated experience, also makes use of other relevant information collected by the WHO.

It is not the purpose of this study to develop any comprehensive long-term plan for medical education in any one country. The development of such plans is the responsibility of governments. The purpose of this study is more limited inasmuch as it merely attempts to elucidate some of the salient problems of medical education in the countries of South-East Asia, to suggest certain steps or measures for the consideration of national authorities, and to give a tentative outline as to how outside assistance might contribute to the efforts of governments to improve the existing situation over the next 5 (-0) years.

This study may perhaps stimulate governments to develop comprehensive long-term plans where none exist, or may expedite their completion or implementation wherever they may be in the course of preparation or awaiting action. Such plans would necessarily have to scrutinize all the available national resources and the potential foreign and international ones, including whatever contribution the WHO could make within the limitations of its programme policy and budgetary means.

MEDICAL MANPOWER AND MEDICAL SCHOOLS

The severe shortage of physicians throughout South-East Asia is one of the greatest obstacles to the countries' health programmes. Whatever interim measures may be taken (like, for instance, import of foreign doctors, redistribution of physicians from urban to rural areas, or training of lower grade medical practitioners) are palliative measures which do not obviate the need for training ever increasing numbers of physicians. The answer to this shortage can only be given by the medical schools, the sole producers of them.

The number of physicians can be raised either by increasing the number of medical schools and/or by increasing the capacity of the existing ones. In most countries of the Region (Burma, Ceylon, India, Indonesia and Thailand), new medical schools have been recently established or are in a more or less advanced stage of being established. The effort to create new schools is, however, not quite paralleled by the equally vital one—that of increasing the capacity of the older schools. The output of most of the existing schools could be increased with relatively little cost if their teaching staffs could be augmented but teaching personnel is one of the most crucial shortages in the Region which impairs the work of most, and there threatens to wreck the work of some of the schools

It seems that the governments do not always have a keen enough appreciation of the deleterious effect which the present low output of the medical schools has on their efforts to improve health and social conditions and their attention should, therefore, be directed to the medical schools as a *conditio sine qua non* to the solution of many of the countries' pressing health needs. Quite specifically the problem of teaching staff should be pointed out as the crucial obstacle to an improvement of the medical manpower situation.

Of all the resources that are needed to develop modern health services in general, and medical education in particular, academic teaching staffs are among the most difficult to provide. Most of the other essentials of a medical school such as buildings, teaching aids, instruments, books, etc., can be more easily provided, in short order if need be, because they are merely dependent on funds which can suddenly become available by the whim or wisdom of the governing political forces. Academic teaching staffs, however, cannot be produced in a hurry because it takes approximately 15 to 20 years to train a senior academic

teacher of required standing and time is not the only factor that counts in developing him into the leader he should be in his field. Governments, therefore, have to realise that if they intend to establish new schools in five, ten or fifteten years, the time to train the teaching staff then needed is now. All the schools they wish to establish in the nearer future will have to struggle for many years to come because teaching staffs were not trained long ago.

As a rule there are two contending claims on the scant number of newly graduated physicians. The government is anxious to fill with them at least some of the many vacant posts in the hospitals, health administration, etc., and the universities try to retain some of the young graduates for continued training so as to augment their teaching staffs. However, the power of the government or the lure of lucrative private practice usually drains away most of the young physicians from the medical school and since there is no increase in the production of new doctors without any increase in teaching staffs the vicious circle continues.

In examining the problem of how to provide more adequate teaching staff, the difference between the basic medical and the clinical sciences becomes obvious. The number of eligible teachers for the main clinical disciplines, small as it may be, often still allows for a choice from among several candidates whereas in the main pre-clinical disciplines there is just as often no candidate whatsoever available at all. In many instances it would not be too difficult to staff clinical departments to their full teaching capacity now, but that would be utterly impossible in the pre-clinical disciplines. If, as already pointed out, the low capacity of the medical schools is one of the main obstacles to the countries' health programmes. The main bottleneck that accounts for the low capacity of the schools is in the basic science departments. If, therefore, any attempt be made to increase the capacity of the schools the start has to be made at this crucial point. The same holds true for the creation of new schools: the real staffing problem is again in the pre-clinical subjects. The main reason, although not the only one, for this state of affairs is to be found in the discrepancy in income between private practice and the salaries full-time teachers receive in the basic sciences.

At this particular point the importance of the basic medical sciences is only considered from the quantitative point of view, namely, how they influence the numbers of graduates in the Region. Later on their significance will be considered from the qualitative point of view, namely, how they influence the type of physician that graduates from the school.

To improve the existing situation in the basic medical sciences is far more difficult than to make improvements in the clinical sphere. In all countries in question the curative tradition is much more firmly rooted than the experimental and investigative approach to scientific and theoretical problems. In the clinical disciplines there mostly exists a certain foundation on which to build and although its scientific solidity may be questioned it is nevertheless there. In the basic sciences that foundation is much weaker.

In order to develop the basic medical sciences in the medical schools three main conditions have to be fulfilled:

1. There has to be a great enough interest in and a clear enough appreciation of the subject so as to create a genuine desire to experiment and investigate, which presupposes a certain kind and degree of intellectual conditioning.
2. Training knowledge and skill have to acquired which are needed to deal with scientific problems.

3. External conditions have to be sufficiently conducive to scientific endeavour among which are primarily adequate premises and facilities.

Besides these three prerequisites, there is also the need for stimulation and guidance, the accumulation of experience in scintific techniques, methodology, and organization, contact with scientists of other countries, etc.

All these factors are inter-related and add up to what may be called the "climate" that is needed for the sciences to thrive in. Any attempt to list them in their order of importance would be open to challenge and the basic medical sciences could no more develop without one than the other. However, if any one of these prerequisites would have to be singled out as the most fundamental, the greatest amount of agreement would probably be reached on the one listed first. The mental attitude that is needed for experimental and investigative laboratory work is probably the most vital of all.

From the above point of view the situation differs in the countries of South-East Asia. In some of them few, if any, of these conditions are fulfilled; in others, many of the essential prerequisites exist and conditions are favourable to the development of that solid groundwork without which modern medicine and health services cannot be built. However, even in the latter countries the situation varies from place to place, which is a very important feature in countries of the size of India or Indonesia.

Assistance to the different countries and schools should, therefore, be offered with great discretion and discrimination and with painstaking regard to the local situation. In some, the "scientific climate" will have to be developed first; in others, independent thought and scientific initiative already exist, but essential equipment and facilities are scarce; and yet in others, well equipped and staffed departments can be found in which only the spark of initiative and originality is lacking. Outside assistance will have to be planned accordingly. The general strategy for the Region may consist of developing a few "strongholds" in selected places which in due course would serve as examples and training centres for the less advanced parts of the country or for the Region as a whole.

The problem of medical manpower in all the countries of the Region is so serious that the establishment of a national planning body, a sort of medical manpower commission, would be warranted. Such commissions should function under highest government authority and should thus be able to correct some of the prevalent disadvantageous practices in the allocation of new graduates. If these commissions had a profound enough appreciation of the role and problems of the medical schools, they could be augmenting teaching staffs and lay the foundations for a long-term plan that would secure a maximum of qualified medical manpower in the shortest possible time.

THE ROLE OF THE MEDICAL SCHOOL

The primary function of a medical school is to train physicians, however, some other functions have also developed gradually which are now taken for granted in all advanced countries. The teaching hospital and the laboratories of the medical school render service of a high order to the community. Being staffed by some of the best trained personnel in the country and being better equipped than most of the ordinary hospitals, they provide the most specialized care available and are called upon by the community as well as by the public authorities to deal with particularly difficult cases and problems. Medical schools have developed into national repositories of medical skill and knowledge. Being perpetually confronted with new and difficult questions to which answers

have to be found, research has inevitably become part of their routine. Thus, the medical schools became not only repositories of old but also the sources of new medical knowledge.

The three traditional or classic functions of a medical school, namely, undergraduate training, service to the community, and research are not all the functions that are either conceivable or desirable. In recent years, some of these functions have been expanded so as to include formal post-graduate training and some preventive and social medical services have been added to the traditional curative ones. The role and function of the medical school may and should differ geographically according to the special needs of the country or region. In the advanced parts of the world, for instance, the need to train physicians for a role of civic leadership may not be so great as in under-developed countries where they are inevitably called upon to assume such responsibilities. A better public health background of the general practitioner, desirable as it is everywhere, may be more imperative in underdeveloped countries where particularly trained public health officers are extremely scarce and where no special training facilities for them exist. Nevertheless, the three traditional functions remain the foundation on which future improvements can develop.

Of the three classic functions, research is essential both to teaching and to providing the type of service that may be expected from a medical school. Without research, no scientific approach to medical and health problems can be developed, no critical evaluation of scientific phenomena can be attained, no scientific methodology can be introduced. Research is, therefore, not a superimposed function or just another responsibility but an integral part of the school's routine.

The medical schools of the countries of the South-East Asia Region have, more or less, fully assumed their undergraduate teaching responsibility and are also rendering service of a relatively high order to the community. The research responsibility has, however, not yet been assumed to any comparable extent. The lack of this function accounts for many of the schools having a more vocational than scientific or academic character. Taking the historical evolution of these schools into consideration this seems quite understandable. In the colonial period, the mother country largely relied on her own metropolitan research resources or provided her own personnel for whatever research institutions were established in the colonies proper. The colonial medical schools were, as a rule, neither designed to give an education equivalent to that given by the schools of the mother country, nor were they called upon to render the same type of service to the community and authorities. Research was, therefore, in many cases, not particularly wanted or needed. However, with the attainment of political independence of the former colonies, the situation has changed.

The new independent countries now have to rely increasingly on their own national scientific resources in their day to day work. They also want doctors of the same high order as those trained elsewhere so as to cope with their new needs. This is obviously the reason in some countries for the upgrading of what were formerly called "Schools" into the present "Colleges". In the new era of national sovereignty the medical schools will gradually have to rise to that higher level of teaching and service to which research is prerequisite. This will, no doubt, require a great deal of time, intelligent planning, and the hard work of at least one or two generations. Progress wll also largely depend on progress made in other spheres; the general political atmosphere, social, economic, and cultural factors, are bound to play their part. However, there are

certain things that can and should be done now if that goal is to be attained in the foreseeable future at all. In some places a good start has already been made, in others we are treading on virgin soil. Whatever efforts may be undertaken now to promote research and scientific medicine are likely to vary from place to place within countries and from country to country within the Region. It will require good judgement not to waste efforts prematurely in certain places and to make the most appropriate next step in others where existing conditions may hold promise of some degree of success.

Closely connected with the question of research and with the scientific character of the schools is the problem of raising adequate teaching staffs. This also is a function of the medical school and it can be said that a school has really reached full maturity only if and when it is capable of developing its own teachers. This requirement does in no way prejudice the advantages of supplementing such training by study periods in other schools or countries with all the beneficial results of "cross-fertilization". Nevertheless, teaching staffs eventually have to become self-prepetuating in a sense that successors to the incumbents are trained by the school in the normal course of its routine functions.

Very few, if any, of the medical schools of the South-East Asia Region have reached this stage yet, and for many years to come they will have to rely more or less on foreign training facilities. However, the better and the more scientific training in their own schools will become the more will fellows benefit from their stay abroad with their fellowships assuming an increasingly senior character. Therefore, any attempts made now to improve the scientific character of the schools will have a short-range as well as a long-range objective in view:

1. The fellows will attain increasingly higher qualifications during their study periods abroad and will in shorter time attain the full qualifications of academic teachers.

2. These better qualified teachers will then in their own schools gradually develop the necessary scientific standards that will eventually enable them to raise their own teachers.

Most of the schools of the Region will, mainly because of the lack of research activities, have to go on functioning for some time on what is more a vocational than an academic level. The professors in these schools should nevertheless have a sound scientific or research background not only to ensure a high quality of instruction but also to promote step by step the transition to the scientific or academic level which is the ultimate goal. These schools may very well turn out qualified practitioners who may exceptionally even become teachers or scientists, however they would in their more vocational stage of evolution not be counted on as major sources for teaching personnel.

Some of the schools of the Region have, however, already developed to an advanced stage where experimental work and some research activities lend more academic character to teaching and training. If supported and assisted in their further development they can be expected to turn out the future specialists, scientists and teachers, and to become the foci or strongholds of scientific medicine in the Region to serve both as examples and as training centres. Research activities in these schools should be encourged, which is not tantamount to the provision of excessively costly equipment. Relatively simple as this research may be to begin with it may nevertheless make a fine contribution both to the country and to the world at large, especially if it concentrated on problems of local significance.

ORIENTATION OF THE MEDICAL SCHOOL

It is generally realized that a certain re-orientation in medical education has become necessary if medical schools are to train physicians better suited for the exigencies of our age. For many years now this problem has been the subject of discussions at the national and international levels including those at the First World Conference on Medical Education held in London in 1953 showed how universal is the interest in this matter.

Most of the problems that arise from the rapid progress in the medical sciences, and consequently from the increased volume to be taught, pertain more or less to all countries alike. There are, however, other problems too that arise from the particular conditions prevailing in the countries and Region which, because of their specific nature, do not receive adequate attention at the broad international level. The type of the ideally suited young medical graduate is different, for instance, in India and in the United States. It is up to the individual countries or groups of countries living under similar conditions to foresee their trends of development and needs and to define the type of physician best suited for their specific requirements. The medical educational system has to be oriented accordingly.

Among the important general trends in modern medical education there is the aim to re-orient teaching from the pre-dominantly individual and curative approach to a more community-minded and preventive one. This re-orientation, desirable as it is everywhere, becomes imperative in the less developed countries where the standards of hygiene and sanitation are so low that individual curative care stands little, if any, chance to improve general health standards. What is a shortcoming in one instance becomes a very serious deficiency in the other. Advanced countries employ numbers of full-time public health specialists whose only concern is the community and they can, therefore, more easily afford to orient their practitioners towards the individual. In the less advanced countries, however, the general practitioner often has to assume some or all the responsibilities of the public health officer in addition to his curative work. If these countries simply followed the lead of the more advanced ones as regards the orientation of their medical schools, some of the specific needs of their countries are bound to be disregarded. For the time being, in practically all countries of the Region medical education follows a certain foreign pattern and often an antiquated version of it. The countries of South-East Asia should, however, re-orient their system of medical education to their own specific needs because no medical educational pattern of any advanced country can be simply copied and be successful.

In some of the countries of the Region medical educators candidly admit that they lack the necessary self-confidence and courage to make important changes. The WHO may provide some guidance and assistance in co-operation with other interested agencies.

Changes in medical education are usually slow in being implemented. They require prolonged study, compromises, and decisions on the academic and governmental levels and at the latter, health, education, finance and political authorities are usually involved. Legislative and executive procedures are, as a rule, cumbersome. It is fair to assume that it will take many years before any comprehensive changes in the system of medical education will be carried out in the countries of the Region. Therefore, whatever relevant work the WHO or other agencies may be doing in the Region has to have both immediate and long-term objectives in mind. The long-term objectives must be pursued concurrently with the short-term day to day work. Urgent projects are often essential to fill the need of the hour, however they may be no more than a waste of

time and money if they obscured the long-range goal, namely, the need for long-range efforts towards preparing and promoting plans for an ultimate re-orientation of the system of medical education so as to give the best answer to countries' medical manpower problems.

CURRICULUM

There is a good measure of world-wide agreement on what are most of the essential subjects in the undergraduate medical curriculum, notwithstanding some divergent views on the essential or non-essential nature of a few subjects and on their exclusion from or inclusion into the curriculum. However, these differences are relatively insignificant in comparison with those that exist in regard to the teaching of the subjects generally considered essential: the time to be allotted and the emphasis to be put on them, the different angles and aspects of the subjects to be particularly stressed, and the various approaches that are possible in their teaching. It is particularly in this sphere that any agreement on changes in the established curriculum is rendered difficult. If it is a valid assumption that the type of physician best suited for the needs of any particular country (or area) is likely to vary more or less according to prevaling specific conditions, then corresponding adjustments in the curriculum are inevitable, because the curriculum is the concrete plan by which the desired type of physician is to be produced.

In a Region such as South-East Asia where the need for physicians is so great it is essential to devise a curriculum where the educational goal can be satisfactorily reached in the shortest possible time. The adherence of the 7-year curriculum in Indonesia, for instance, which follows the Dutch pattern is too long for a country with a physician-population ratio of 1:60,000. The length of the medical curriculum should be the outcome of an acceptable compromise between the country's medical manpower needs and the time required to teach successfully all that is deemed necessary.

The considerable differences in the length of medical curricula that seem to exist in different countries of the world, are more apparent than real. The 4-year's curriculum in the medical schools of the United States, for instance, is based on the requirements of a premedical college or university course which as a rule brings up the total time required to eight, or at least seven years, which equals the apparently much longer medical school curricula for instance in Holland or Sweden. The length of the medical curriculum in the various countries in South-East Asia will similarly be determined by whatever is the educational status of the student who enters medical school. A satisfactory solution of the problem of the undergraduate medical curriculum may require certain adjustments in the teaching plans of the institutions of preliminary education and therefore co-operation between the Ministries of Education and Health on the national plan is as desirable as collaboration between UNESCO and the WHO on the international level.

The numerous details in planning the curriculum cannot be dealt with in this study and should be left to representative national committees with relevant terms of reference. Only some of the broad principles will be touched upon. These may in some instances relate to the undergraduate medical curriculum as a whole, in others mainly to one of its three major component parts, namely, to the basic sciences, to the clinical subjects, and to the preventive socio-medical and public health sector.

In the teaching of the basic medical sciences there is now a fairly universal trend to give adequate emphasis to the functional understanding of health and disease alongside the morphological and to ease the traditional heavy load on the student of too detailed anatomy in favour of improving teaching in physiology and by giving more emphasis to biochemistry and to experimental pharmacology. In pathology, too, a certain experimental approach may be discerned in addition to the purely descriptive morbid anatomy. General and experimental pathology or what may be called pathological physiology may in most places not be a separate subject in the curriculum, but makes itself felt in the teaching of other subjects such as biochemistry, pathology, and pharmacology. In the schools of South-East Asia the predominance of morphology in the teaching of the basic sciences is still a fairly general feature which is expressed by the pre-eminence given to anatomy and by the virtual absence in most places of adequate teaching in biochemistry and experimental pharmacology.

In many schools of the Region the old British pattern of teaching histology in the department of physiology is still being followed, although in some instances it has already been transferred to the department of anatomy. This is in keeping with the more recent trend in the United Kingdom and it is to be hoped that it will be followed more generally.

The question as to whether physiology and biochemistry should be separated has to be considered in the light of the state of development of these two specialities in any particular instance. In many schools of the Region the science of biochemistry is still in its infancy, and it would seem that the development of experimental mammalian physiology is one of the prerequisites of its development. Wherever the teaching of physiology leaves to be desired in this respect, and where biochemistry is still in its early beginnings, the two specialities should probably remain in one and the same department until further progress will justify establishing separate ones. In the long run biochemistry should assert itself as a discipline in its own right which is the general trend in most of the advanced countries.

The teaching of pharmacology in most of the schools of the Region consists of the old Materia Medica and pharmacy course rather than being experimental pharmacology. However, because of the need in South-East Asia of physicians dispensing medicines, the old course should not be discarded or replaced, but perhaps only improved and revitalized by the inclusion of some instruction in experimental pharmacology, so as to convey basic knowledge on pharmacodynamics.

Each and every pre-clinical department can derive considerable support from co-operation with each other, and also with the clinical departments. In the teaching of the basic medical sciences in many places use is being made, for instance, of X-Ray pictures in anatomy, and certain anatomical details and physiological processes are being observed on the live human body. The introduction of similar teaching practices may be particularly important in a Region where instruction should be particularly oriented towards the practical (see below). Although some inter-departmental collaboration may be formally prescribed in whatever curriculum may be devised, a great deal more will depend on the understanding and on the team spirit of the department heads in teaching their courses. Strict isolation or compartmentalization of the individual departments is not conducive to such teaching.

The entire curriculum of the medical schools of South-East Asia and particularly its clinical part should be slanted towards the practical because young

physicians more often than not go into practice soon after graduating. In general it may be said that as small-group bedside teaching replaces part of the previously predominant didactic lecturing, teaching and training will also become more practical. Staff shortages that are at present an obstacle to small-group teaching in South-East Asia are, however, less severe in the clinical specialties than in the basic sciences, and can be more easily and rapidly overcome. If some of the suitable hospitals not now engaged in training undergraduates could be so utilized, further improvement in practical instruction may be attained. Some inspiration from what is the practice in French Medical schools which brings students into contact with hospital patients from the earliest stages of their studies, may be useful in promoting the practical slant, although it is realized that such innovations are not easily accomplished. However, in the Anglo-American pattern of medical education too there is now a trend to bring the student in touch with patients sooner than was the case up until now, and any such attempts in certain countries of a Region would not be out of tune with the pattern hitherto followed. To find the proper compromise solution to this intricate issue will be clearly one of the major problems to be dealt with by those who will revise the present curricula.

With all due reservations it may be said that the backbone of the general practitioner's clinical training are the four specialties of internal medicine, surgery, obstetrics and gynaecology, and paediatrics. Of these four key-disciplines only paediatrics is still struggling in South-East Asia to gain the proper recognition of its place among the "Big Four" and to be taught as adequately as the other three subjects. In devising new curricula this shortcoming should be corrected wherever it exists.

The detailed curriculum in these four major subjects should be so devised as to suit the country's particular needs. In internal medicine greater emphasis would necessarily be placed on the teaching of infectious and communicable diseases, on parasitic infestations, on nutritional deficiencies, etc., than in countries where many of the conditions prevalent in South-East Asia would amount to clinical rarities. In surgery the rural practitioner, compelled by the force of circumstances to deal with surgical problems and emergencies more independently than those who have ample hospital facilities in easy reach, should probably have more practical training in minor surgery than which is usually given to medical students in more advanced countries. The need for practical training in obstetrics and gynaecology is equally obvious. In paediatrics a judicious combination or synthesis of clinical and preventive or social paediatrics may be the answer to some of the specific needs of the Region.

The place in the curriculum of the other essential clinical specialties such as dermatology, ophthalmology, psychiatry, etc., will also depend on many of the particular circumstances in the various countries. In some instances, for example, dermatology or ophthalmology, or at least certain parts of these specialities (yaws, trachoma, etc.) may assume particular importance. The selection of the material to be taught to undergraduates in greater detail is thus an essential problem in all subjects, but perhaps even more so in those specialities where the general practitioner's scope of action is naturally limited. An isolated rural general practitioner will, for instance, have to deal with otorhinolaryngological or ophthalmological cases which practitioners, who have specialists nearby, would not have to handle. This is to say that the student should be taught otorhinolaryngology and ophthalmology but only as extensively as its practice is possible within his scope of action. It would be mistaken, for instance, to

introduce with the subjects the complicated details of major otorniclaryngological surgery or all the refinements of ophthalmological diagnosis for which complicated and costly optical instruments are available in specialized hospitals only.

In countries—where there is a shortage of dotors, where the general practitioner is very often the public health officer, and where there are scarce or no adequate postgraduate training facilities in public health—the need for more and better undergraduate teaching in preventive medicine and public health is probably greater than may be the case in more advanced countries. Wherever the health of the community as a whole is more or less safeguarded against elementary public health hazards, there exists a solid foundation on which the general level of health can be gradually raised by improvement and extension of individual curative medical care. Even in the communities of such countries steady progress in preventive and public health measures has to go hand in hand with progress in curative medicine. However, in those countries where that solid foundation of protective public health measures is lacking, and where the communities are still exposed to the most trivial public health hazards, no mere extension or improvement of individual curative care in itself can hope to raise appreciably the general level of health.

This difference has to be appreciated in order to find expression in the undergraduate medical curriculum and thus in the training of physicians best suited for their countries' needs. There seems to exist in the Region, both in some government and academic circles the erroneous notion that by allotting more time to problems of sanitation, for instance, than is the case in most of the advanced countries, the graduate may turn out to be scientifically inferior to his Western equivalent and/or that his training in curative medicine may be impaired. The fact, however, is that some of the material suggested to be included in the undergraduate curriculum in South-East Asia is reserved for postgraduate public health training in many of the more advanced countries. The need to teach some of this material in the undergraduate medical courses in South-East Asia will last as long as postgraduate training facilities in public health will not be sufficiently extended so as to produce enough specialists in public health who will be able to take care of the public health needs of the population.

The inclusion of more public health teaching in the undergraduate medical studies could perhaps be accomplished without lengthening the curriculum by careful elimination of some of the non-too-essential material of which there is still some left here and there in the undergraduate courses in the advanced countries. If, however, that should not be found feasible, then it may be worthwhile to allow approximately an equivalent of three months time for this purpose specifically. This suggestion is not contradiction to what has been said above about the necessity of devising the shortest possible curriculum by which the educational goal can be satisfactorily attained because in South-East Asia a certain mandatory amount of public health training should be considered an integral part of the undergraduate's educational goal.

Just as the whole curriculum should be slanted towards the practical, it should also be slanted towards the preventive aspects of medicine. The latter is more difficult to accomplish than the former because it requires a more profound change in the teacher's orientation. It is easier to have a physiologist or a surgeon, for instance stress what is practically important than to make the curatively minded professor bring out what is important from the point of view of prevention. There are in the whole world relatively few medical school

teachers in the basic sciences and in the clinical subjects who are genuinely preventive minded, and it may perhaps be asking for too much from the teachers in South-East Asia virtually to lead the way for the rest of the world. However, here is a field where, because of the recognized necessity, less advanced countries may lead the otherwise more advanced ones.

The path that leads to more preventive minded teaching in medicine is likely to be the same in South-East Asia as in the rest of the world. The creation of a Chair of Preventive Medicine in each medical school gives the preventive line of thought a firm crystallizing point. Instead of considering this Chair the one solely responsible for teaching the preventive angle, it should become the collaborator of each chair and course in promoting preventive thought throughout the undergraduate curriculum. Since professors cannot impart to their students an attitude that they themselves do not possess, the professors should be the first ones to learn how to be preventive minded, and only then will this attitude penetrate to the student body. This difficult process of reorientation could be aided besides the creation of a Chair of Preventive Medicine, by short-term consultants chosen from among the available few in the basic and clinical sciences who have already accomplished this readjustment.

There is also another difficulty as regards the teaching of preventive medicine. This is a relatively new subject and, although there exist a few examples of outlines for courses in various countries, there is no general agreement on what exactly is to constitute the substance to be taught. Available outlines cannot simply be transplanted from one country to another because whatever is to be taught very much depends on the particular objectives individual countries strive for in their health, social and other policies. Under the circumstances, a professor of preventive medicine is at a disadvantage in the faculty in comparison with his other colleagues: in all other subjects the body of knowledge to be taught has in the course of time become essentially well-defined, but in preventive medicine the professor really has to search for and eventually compile that body of knowledge which is to be imparted to the students in his school or country to the best advantage of the community. Professors of preventive medicine are scarce in all countries, and scarce as they are, they cannot be easily transferred to other countries to teach there what might have been appropriate in their own. This leads to the conclusion that every country really has to develop its own teaching staff in preventive and social medicine even if some outside assistance towards attaining that goal may be provided.

The public health courses in medical schools is usually scheduled towards the end of the curriculum. By that time the student has already fully developed his attitudes and preferences and is almost naturally fully oriented towards the individual care of the sick. The often perfunctory course in preventive medicine and/or public health thus lacks organic cohesion with the rest of the curriculum and can hardly convey to the student the real significance of his future responsibilities to the community. If, however, among the few initial lectures given to the young medical student, one or two were included to turn his attention to the social and preventive aspects of his future practice, if in the course of his preclinical and clinical studies this attention were kept alive by pointing out pertinent points occasionally but consistently, if perhaps the course in public health could take place in the early part of his clinical studies, and if it were enlivened by carefully selected field visits, it may in the end be possible to train a physician who would have added to his professional armament the understanding of the preventive and public health approach without having anything detracted from his skill, knowledge and scientific background with which he is ready to assume his role at the bedside of the patient.

TEACHING

Teaching methods preferred in medical schools the world over vary considerably and there is no consensus of opinion as to what are the best teaching methods in general or in the various specialty subjects in particular. Certain apparent trends—more or less prominent in different schools and countries—have no claim to universal recognition because the best way of how to teach medicine partly depends on such local factors as the general cultural pattern, educational traditions, the type and quality of secondary and pre-medical education, the lack of or availability of adequate quality and quantities of teachers, facilities, etc.

In some places, for instance, tutorial small group teaching is recognized as the method of choice in preference to, or almost to the exclusion of, didactic lectures. Because of the great numbers of teaching staff required for this type of instruction, its application in South-East Asia is not quite feasible for the time being even where it is found to be desirable. Similarly, certain basic science laboratory courses as given elsewhere might not be fully duplicated because of the lack of teaching personnel, laboratory technicians, workshops, and equipment, or perhaps because of inadequate pre-medical courses in the natural sciences. Unanimity may perhaps be reached on what would be ideal teaching techniques in a certain set of conditions but they would not be easily applicable to other conditions where essential prerequisites are lacking.

Since teaching methods are not applied in a vacuum and do not stand by themselves, their choice should to a certain extent depend on the setting in which they are to be employed. The medical schools of South-East Asia will have to select and adopt them so as to suit their particular requirements and circumstances and any future conferences on medical education in South-East Asia should devote due attention to the important problem of teaching methods and techniques.

One of the questions that has to be carefully considered in this connection is the present system of examinations which unduly dominates both the teachers' and the students' efforts. The professors seem to teach so as to prepare their students for their examinations and the students are apt to concentrate on learning what they are likely to be asked. Thus there is a danger of losing sight of the educational goal which is the acquisition by the student of all the knowledge and skill needed for adequately practising his profession. It is only theoretically true that a successful examination is tantamount to having reached the educational goal. Once the passing of examinations is mistaken for the goal, the educational effort becomes distorted and falls short of the objective.

The high examination "mortality rate" in many of the schools of the Region is indicative of inadequacies calling for correction either in the selection of students, or in the teaching, or finally in the type of examinations. The average intellectual quality of students in South-East Asia is in no way inferior to that found elsewhere although in some places their secondary and pre-medical education should be improved upon. It is, therefore, mostly in the teaching and in the at present customary type of examinations that the faults will be found.

Examinations are merely one of the many educational techniques by which the educational goal is to be attained. At their best, they are often misleading and should not be the one and only criterion by which to assess the students' aptitude and knowledge. Continuous observation of the student as regards his reasoning, originality, clinical proficiency, etc., may provide equally or even more important information than checking up on his memory, and should be taken into account in deciding whether or not to pass the candidate.

The types of examinations used in different countries vary widely. There is not one best way of conducting examinations but there are a number of equally good or bad ones depending on the circumstances. A case can be made for and against the oral or the written examination and/or any of its variations or combinations. The routine "multiple choice" and similar techniques so generally and satisfactorily used, for instance, in America are quite different from those favoured in other educational settings. The medical schools of South-East Asia will eventually develop and adopt the method best suited for their particular conditions and it may considerably differ from the methods currently used.

The emphasis now put on memorizing in examinations is the expression and result of the emphasis that is put on it in teaching.

No deliberate enough effort is made in the schools of South-East Asia to teach the students critical scientific reasoning and to encourage independent thought. The student should learn the sound application of general principles to any particular case instead of trying to memorize all the particular cases he may encounter. Thus, for instance, instead of teaching "diseases", the functional (pathological-physiological) mechanism of disease should be taught. The student will so learn how to deal intelligently with any situation which he may encounter instead of only knowing how to deal with situations which he has particularly learnt about.

The solution of the problems just discussed rests almost entirely with the medical educational institutions concerned (universities, colleges, and their staffs). In this they differ from most of the other major problems of the medical schools which depend on governmental or foreign assistance for their solution. All that is needed in the particular instance is a certain mental re-orientation, a change in approach and attitude. Simple as this may sound, it amounts to a very fundamental change that is not easy to accomplish and will probably be attained only gradually by determined and consistent effort. Attitudes consist of many emotional components besides the rational ones and do therefore not obey to reason alone. Because of the emotional element they are deep-rooted and therein lies the difficulty. First, it is necessary that each and every teacher give a great deal of thought to these problems which should then be discussed, analyzed and eventually dealt with by the various departments of the schools, by the schools as a whole, and eventually on a nation-wide and regional basis.

A systematic effort should be made to promote such discussions in the medical schools and universities preparatory to calling wider conferences to deal with these problems specifically. Conferences on medical education were held in most countries of the Region in connection with the Visiting Teams of Medical Scientists. These conferences surveyed in a very general way most of the major problems of education. Future conferences should preferably concentrate on some of the problems and should become the stepping stones towards a new approach.

THE MEDICAL STUDENT

The medical student may be called the human "raw material" whom the school has to mould into a "finished product" most closely resembling the type of physician envisaged by the educational goal. The school has to teach the student in a manner that he be able to learn adequately the professional

skill and knowledge required, and it also has to help the medical student develop the proper attitudes and character traits which are essential to the successful practice of his future profession.

The young medical student is, however, not quite "raw material" on admission because his preliminary education will to a certain extent determine the ease or difficulty by which he absorbs his medical school subjects and the school may also have to adjust its teaching to the general level of the preliminary education of its students. As far as the likings, preferences, attitudes and traits of character of the student are concerned he is also a pre-conditioned product of his preliminary education which may either facilitate or impede the task of the school.

In certain countries, therefore, these considerations among others, led to the institution of selecting medical students from the point of view of educational prerequisites as well as from the point of view of their state of health, character, psychological attitudes, etc. The principle of such selection is, however, not universally accepted. In other countries, it is a matter of national policy to keep the doors of medical schools wide open, and such is the case in most instances in South-East Asia where a sort of natural selection is allowed to take place by the survival of the fittest in studies and examinations in the first year or two. Whether or not any country decides to limit the number of medical students, to adopt or reject the principle of selection, depends very much on local conditions, outlook, tradition, including political and social philosophy and expediency. Between the two existing extremes, namely, that anybody who fulfils the general entrance requirements has the right to be admitted, and that only a limited number of those who fulfil these requirements are admitted to the school by a rigorous and self-devised selection procedure, there are various intermediate solutions conceivable. The advantages of the system of unlimited admissions seem to make up in the view of the relevant authorities its obvious disadvantages, namely, that it is wasteful of time and funds, and that it impairs the studies in the first year or two of the students who will presevere. It may perhaps in some instances be possible to devise a selection system which instead of admitting only the few considered best qualified, would merely exclude the few considered least suited or fitted for medical school. In those countries which find themselves in the process of rapid economic and social changes, particular attention should be given to the promotion of the worthy and promising human elements, and wherever financial limitations may threaten to bar their way, a system of governmental stipends or other forms of assistance could provide equal opportunities to students from the poorer families and social groups.

These are some of the considerations of importance to medical students up to the point of entry into medical school.

As soon as he has become a medical student, the process of his moulding will be guided and supported along three main lines of his individual development: the acquisition of professional knowledge, the unfolding of his character and attitudes, and his physical and material circumstances of living. If during his medical studies the student has to live in poor living quarters on inadequate food, and has to struggle for bare essentials, all of which make for poor health and diminished receptiveness to the school's influence, it is more likely than not that he will be less successful in learning all that is needed and in developing the proper attitudes and the best character traits. Therefore, the school should assume the responsibility for the student's health by providing a student's health

service and should also take an interest in the students' social welfare, which is a difficult responsibility in a region where the schools themselves are often very poor.

In what was referred to as the other two main lines of development, the student, throughout his studies, will be exposed to a number of major formative influences.

First of all, in the course of learning, he becomes conscious of the vastness of professional knowledge, part of which he will acquire, and this will determine his professional horizon and proficiency. The student has to learn, above all, what he will actually need for his future work, and since he himself can have only very hazy ideas on that score, he naturally relies on the guidance of his teachers in whom, as a rule, he has a great deal of confidence; he respects their superior experience and judgment. The teacher has a corresponding responsibility to live up to this trust and confidence.

Besides accepted scientific facts teachers inevitably relate personal impressions and opinions to which the student cannot always distinguish as such. They also stimulate certain attitudes towards medicine, the sciences in general as regards, for instance, study and research. One of the attitudes that the teachers should quite consciously strive to implant into their students is the drive for continued reading and learning and the student should be made to realize that the study of medicine is a life-time occupation. Teachers may also preach rules of conduct and thus all this teaching, in addition to the factual material taught, amount to another major formative influence on the student, not only when he develops his own opinions on technical matters, but when he develops his professional behaviour pattern, his psychological reactions and attitudes.

A third major formative influence is the example that the teacher unconsciously provides by his behaviour, his attitudes, and actions which reveal his personal views on the social responsibility of medicine, the doctor, including himself. The medical student keenly observes his teachers whose example he is prone to follow. The way the teacher deals with his patients, his students, and his colleagues are likely to have a lifetime effect on the student.

A fourth major influence to which the medical student is exposed are his relationships with his fellow students both in work and in play. They will also influence the development of his character and attitudes: the study circles, students' clubs and collegiate sports often have a decisive influence on what sort of colleague he will be, how co-operative and capable of team work. They may also develop in him leadership qualities and a greater sense of social responsibility.

The student who is undergoing this great transformation of the educational, ethical, and psychological component parts of his personality may not be conscious of how the process takes place in spite of his active contribution to it. However, the teaching staff of the medical school should be aware of all the ramifications and of the full implications of all these influences on the three main lines of development on the student. If so, the school will not only provide him with professional skill and knowledge, but will also help him to develop the necessary psychological attitudes and a better understanding of the humanitarian forces in human relationships, based on medical ethics, which will be so important for his future career. Participation in family care programmes, field work under guidance, examples from the teaching staff, students' associations, etc., will then all promote the attainment of the educational goal.

GENERAL CONCLUSIONS

The interdependent problems of the medical schools and of medical manpower in South-East Asia cannot be solved without effective government action. Assistance from the outside may supplement the governmental effort but is no substitute for it. The increase in numbers of qualified teaching staff in the medical schools is the most urgent task.

The interest of governments should be stimulated in and directed to the following salient issues:

1. *Creation of an authoritative national body in each country, where none exists, duly commissioned to prepare a reform in medical education. Wherever there is already such a body the WHO should make efforts to co-operate with it and to assist in its activities. This national body should—*

(*a*) Define the type and qualifications of the physician believed to be best suited for the specific needs of the country.

(*b*) Draft the new curriculum for medical under-graduate studies accordingly.

(*c*) Follow up as far as possible the plan evolved on its way through the administrative machinery until it is eventually legally enacted.

2. *The need for increasing and improving academic teaching staff in general.*

(*a*) Increase the number of adequately paid full-time professors.

(*b*) Increase the number of adequately paid full-time lecturers and assistants.

(*c*) Selection of academic personnel by academic authorities.

(*d*) Security as regards tenure of academic appointments.

(*e*) Support of research in selected places.

(*f*) Establishment of improved library facilities.

3. *The need for increasing and improving academic teaching staffs in the basic medical sciences in particular.*

(*a*) Creation of national or regional training centres (especially in biochemistry, physiology and pharmacology) wherever indigenous resources permit.

(*b*) Organization of demonstration courses for teachers in experimental and teaching techniques by using both local and foreign personnel.

(*c*) Provision of an adequate number of fellowships to the basic medical sciences from the different kinds of fellowships available.

(*d*) Procurement of essential equipment for the basic medical science departments.

(*e*) Provision of other essential facilities such as instrument workshops, glass blowing facilities, etc.

(*f*) Discontinuation of the practice of pre-clinical departments doing routine laboratory work for the hospitals.

4. *The necessity for increasing the budgets and resources of medical schools.*

(*a*) Government subsidies.

(*b*) Improved co-ordination of outside assistance.

THE NEXT APPROPRIATE STEP:

The guidance of the Regional Committee is now requested with regard to the next appropriate step that should be taken by the Regional Office in this important field. It seems very desirable that a conference be called in the near future, to discuss these problems of medical education. This conference could be either at the regional level or at the national level; or again a series of national level conferences followed by a regional level conference. Preparatory national discussions could take place in the countries themselves in order to study the local aspects of this problem. These discussions will need to take place in full co-operation with the educational and professional groups especially Education Ministries. They need not necessarily be full size national conferences (those may come later), but rather small study groups which will orientate the governments as to the programmes and plans of action. They should be of the highest competence available in the country. WHO staff could assist in any of these study groups or national conferences in the form of participation in a discussion, through short-term consultants as well as through regular WHO staff from the Regional Office or from WHO headquarters. At the national level the Government of India with the Rockefeller Foundation have already held a preliminary conference on medical education in Bangalore--May 31 to June 1. This was in the nature of a study group which dealt with the possible holding of a general conference or seminar on under-graduate medical education at the national level in India which could discuss aspects such as the type of doctor needed for India, pre-medical studies, entrance requirements, curriculum hours, methods of teaching, subjects needing special emphasis, methods of examination etc. It seems desirable that a highly competent observer in medical education from each of the countries within the region might attend any national conference that might develop in India. WHO assistance could be considered for this purpose so that in the wake of such an Indian conference national conferences in other countries might be stimulated during the next 3 to 4 years. Finally, if necessary, a regional level conference might prove useful. It is realised that the subject of medical education involves Education Ministries as much as Health Ministries. The Regional Committee may therefore wish to urge the Member States to begin preliminary discussions amongst the different governmental and University authorities and professional groups concerned with medical education and gradually to develop, under appropriate auspices, a national conference on medical education. In such an event the Regional Committee might wish to pass an appropriate resolution.

Participants in Visiting Teams of Medical Scientists to the South-East Asia Region.

No.	Name of Title	Country of recruitment	Specially represented on WHO assignment	Total duration of WHO assignment/s in SEAR (in months)	Countries visited in SEAR	Countries visited on other WHO Assignments	Other medical educational experience in SEAR
1	2	3	4	5	6	7	8
1.	Dr. J. C. AUB, Professor of Research Medicine Harvard University, Boston, Mass.	U. S. A.	Internal Medicine .	2	India		
2.	Dr. J. S. Barr, John Ball and Buckminster Brown Clinical Professor of Orthopaedic Surgery, Harvard University, Boston, Mass.	U. S. A.	Orthopaedic Surgery .	2	Indonesia		
3.	Mr. E. Boyce, Professor of Public Health Engineering, University of Michigan, School of Public Health, Ann Arbor, Mich.	U. S. A.	Sanitary Engineering	2	Indonesia		
4.	Dr. F. S. P. Van Buchem, Professor of Medicine University of Groningen.	Holland	Internal Medicine .	2	India Burma Ceylon		
5.	Dr. E. W. H. Crutckshank, Professor of Physiology, University of Aberdeen.	U. K. (Scotland)	Physiology . .	4	India Burma Ceylon Indonesia	....	Professor of Physiology and Bio-Chemistry, Prince of Wales Medical College, Patna India, 1926-28.

Participants in Visiting Teams of Medical Scientists to the South-East Asia Region—contd.

No.	Name of Title	Country of recruitment	Specially represented on WHO assignment	Total duration of WHO assignment/s in SEAR (in months)	Countries visited in SEAR	Countries visited on other WHO Assignments	Other medical educational experience in SEAR
1	2	3	4	5	6	7	8
6.	Dr. S. C. Cullien . . .	U. S. A.	Anaesthesiology .	1	India	Member of WHO/USC Medical Teaching Mission to Austria, 1947. Snr. Instr. Anaesthesiology Training Centre, Copenhagen, 1950.	
7.	Dr. K. Evang, Director-General of Public Health, Norway.	Norway	Public Health Administration.	2	India	Vice-Chairman WHO/USC Medical Teaching Mission to Israel and Chairman of its Public Health Group, 1951.	
8.	Sir A. Fleming, Principal, The Wright-Fleming Institute of Microbiology, University of London.	U. K. (England)	Microbiology .	2	India		
9.	Dr. M. Florkin, Professor of Biochemistry, University of Liege	Belgium	Biochemistry .	2	India Burma Ceylon		

10. Dr. J. E. Gordon, Professor of Preventive Medicine and Epidemiology, Harvard University Schoool Public Health, Boston, Mass.	U. S. A.	Epidemiology .	4	India Burma Ceylon	Member of WHO/USC Medical Teaching Mission to Israel, 1951.	
11. Dr. E. Grasset, Professor of Bacteriology and Public Health, University of Geneva.	Switzerland	Bacteriology and Epidemiology.	2	Indonesia		
12. Dr. E. Grzegorzewski, Professor of Public Health, Director of WHO Division of Education and Training Services, Geneva.	WHO Headquarters	Medical Education .	4	India Burma Ceylon Indonesia	As WHO Staff Member, extensive travel in any countries in Europe, Asia, Africa and the America.	As WHO Staff Member to India, Burma, Ceylon, Thailand, Indonesia irrespective of as well as in connexion with participation in visiting Teams of Medical Scientists.
13. Dr. C. Heymans, Professor of Pharmacology, University of Copenhagen.	Belgium	Pharmacology .	2	India	Member of Advisory Group on Medical Education to Iran, 1952.	
14. Dr. E. Husfeldt, Professor of Surgery, University of Ghent.	Denmark	Thoracic Surgery .	4	India (2) Burma Ceylon	Leader of WHO Thoracic Surgery Team to Turkey and Israel, 1950.	
15. Dr. V. R. Khanolkar, Professor of Pathology, University of Bombay.	India	Pathology . .	2	Indonesia	Member of group carrying out survey of Medical Education in Afghanistan, 1950.	Professional career spent principally in SEAR.

Participants in Visiting Teams of Medical Scientists to the South-East Asia Region—contd.

No.	Name of Title	Country of recruitment	Specially represented on WHO assignment	Total duration of WHO assignment/s in SEAR (in months)	Countries visited in SEAR	Countries visited on other WHO Assignments	Other medical educational experience in SEAR
1	2	3	4	5	6	7	8
16.	Dr. S. Z. Levine, Professor of Paediatrics, Cornell University.	U. S. A.	Paediatrics	2	India	Member of USC/WHO Medical Mission to Poland and Finland, 1948. Chairman WHO Visiting Team, Infant Metabolism Seminars at Leyden and Stockholm, 1950. Member of WHO/USC Medical Teaching Mission to Israel and Iran, 1951.	
17.	Dr. E. Lundsgaard, Professor of Physiology, University of Copenhagen.	Denmark	Physiology	2	India		
18.	Dr. M. R. Mac Charles, Associate Professor of Surgery, University of Manitoba.	Canada	General Survey	2	India Burma Ceyon		
19.	Dr. R. R. Macintosh, Nuffield Professor of Anaesthesiology, University of Oxford.	U. K. (England)	Anaesthesiology	3	India Indonesia		

20. Dr. O. Olsson, Professor of Diagnostic Radiology, University of Lund.	Sweden	Radiography . .	2	Indonesia	
21. Dr. H. Osmond-Clarke, Hon. Surgeon and Assistant Director, The Orthopaedic and Accident Hospital, University of London.	U. K. (England)	Orthopaedic Surgery	2	India	Member of WHO/USC Medical Teaching Mission to Israel, 1951.
22. Dr. G. Portmann, Professor of Oto-Rhino-Laryngology, University of Bordeaux.	France	Oto-Rhino-Laryngology	2	India	
23. Dr. L. G. Rigler,. Professor of Radiology, University of Minnesota, Minneapo.is	U. S. A	Radiology . .	2	India	Member of WHO/USC Medical Teaching Mission to Israel and Iran, 1951
24. Dr. M. L. Rosenhem, Professor of Medicine, University College Hospital Medical School, University of London.	U. K. (England)	Internal Medicine .	2	Indonesia	
25. Dr. H. O. Schild, Reader in Pharmacology, University College, London.	U. K. (England)	Pharmacology . .	2	India Burma Ceylon	
26. Dr. F. J. Stare, Professor of Nutrition, Harvard University School of Public Health, Boston, Mass.	U. S. A.	Nutrition . . .	2	Indonesia	
27. Dr. A. C. Stevenson, Professor of Social and Preventive Medicine, The Queen's University of Belfast.	U. K. (England)	Public Health Administration.	2	Indonesia	

Participants in Visiting Teams of Medical Scientists to the South-East Asia Region—concld.

No.	Name of Title	Country of recruitment	Specially represented on WHO assignment	Total duration of WHO assignment/s in SEAR (in months)	Countries visited in SEAR	Countries visited on other WHO Assignments	Other medical educational experience in SEAR
1	2	3	4	5	6	7	8
28.	Dr. B. Vahlquist, Professor of Paediatrics, University of Uppsala.	Sweden	Paediatrics	2	India Burma Ceylon		
29.	Dr. P. Valdoni, Professor of Surgery, University of Rome.	Italy	General Surgery	2	India		
30.	Dr. E. Wain Andersen, Director of Anaesthesia, Copenhagen Country Hospital.	Denmark	Anaesthesiology	2	India Burma Ceylon	Member of WHO Thoracic Surgery Team to Trukey and Israel, 1950.	
31.	Dr. A. Wallgren, Professor of Paediatrics, Royal Garolline Institute, University of Stockholm.	Sweden	Paediatrics	2	Indonesia		
32.	Dr. E. Rohan Williams, Director of Diagnostic Radiology, St. Mary's Hospital, London.	U. K. (England)	Radiology	2	India Burma Ceylon		
33.	Dr. H. B. Wolff, Professor of Surgery, University of Lund.	Sweden	General Surgery	2	Indonesia		

APPENDIX III(2)

DEVELOPMENT OF PAEDIATRIC UNDERGRADUATE TEACHING IN MEDICAL COLLEGES IN INDIA

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Morbidity and mortality rates for children in India are so high that consideration of improvement of child care deserves top priority. It is estimated that one out of every two children in this country die before the age of 15, *i.e.*, before they have a chance to contribute to the economy; and thus economic loss has to be added to wastage of life. No attempt has been made so far to translate this economic loss into figures, but some indication of the magnitude of the loss can be deduced from a U.S.A. investigation according to which the up-bringing of a child till the age of 18, requires a sum equivalent to 4 times the annual income of the family.

Infant mortality, despite the official lower numbers, is—as indicated by a number of reliable investigations—still around 200 per 1000, which means that well over 2 million infants die every year in India—nearly 2/3 of the population of Norway, and equivalent to the total population of New Zealand.

It is difficult to estimate the morbidity, but a visit to any out-patients' clinic will show how immense is the number of sick children. The pressure of these clinics is so enormous that some handle about 700 childen in one morning.

No doubt, child mortality and morbidity is not solely a measure of the efficacy of medical service. It depends to a large extent on the economic situation of the country, the educational standards, the social services, and so on; but there is just as little doubt that a well qualified and active medical profession can be instrumental in better utilization of the available resources for the maintenance of the health of the children.

It has been argued that in a country with a small number of physicians, general, rather than specialised, knowledge is required. But paediatrics is not a speciality like ophthalmology or neurology. In fact, it is the only branch of medicine which is not *a speciality and a paediatrician is the only type of medical man whose training renders him a general practitioner in the real sense of the word*—except that he is concerned with the growing organism and not with the grown-up.

There is a belief that as long as a doctor has knowledge of diseases, this knowledge can be applied to childen as well as to grown-ups, and all that is necessary is adjustment of dosage of drugs. This philosophy was prevalent in the western world before the advent of paediatrics and was probably responsible for the slow impact of medicine on the general health. To quote Sir James Spence "Look after 100 babies and you look after 100 families". Paediatrics are an essential part of medicine, in which a few may specialize, in order to advance science and practice, but it should be the domain of every general practitioner. Nobody ought by right be called a general practitioner as long as he lacks the knowledge which is necessary in order to care in a satisfactory manner with the majority of the population.

Another reason for the lack of interest in developing paediatrics is a misconception expressed in the wide-spread opinion that there are two branches of paediatrics—preventive, and curative or clinical. It is stated that while "clinical" paediatrics benefit only a handful of children, it is the development of preventive and promotional aspects of child care, which is most important as it serves in child health centres a large proportion of the child population, and its object is simpler and more effective than hospital or out-patients' clinics. Those who thus argue, apparently believe that well child care is a matter that can be left to auxiliary personnel as it involves nothing but a number of simple routine measures. Here, of course, lies the major fallacy because: *the simpler the routine, the more sure one has to be of its ground.* Only under the guidance of highly qualified experts, and based on extensive research and permanent evaluation of the routine procedure can one expect those to be effective. Otherwise the routine becomes no more than "going through the motions", and it is not merely useless, but potentially dangerous—lulling those responsible into false security.

If any proof that child health services rendered without proper supervision have little impact is required, reports of the various pilot projects in India should be studied. Thus for instance, one of the best established health units in the country—Poonamalle (Madras)—quotes infant mortality rates unchanged since 1946.

While in order to *establish* effective child care services it is necessary, as mentioned above, to have a nucleus of high grade specialists, well versed with the specific problems of the country, in order *to secure effective services,* the rank and file of the medical practitioners, armed with sufficient knowledge in child care are essential.

How then are the changes in some more fortunate countries to be explained. There, preventive care did not develop as a separate activity, but additional and supplementary to already existing treatment and research facilities. In the first stages of development of well child care, the pioneers of modern paediatrics took personal charge of the clinic, and even now in many countries only highly specialized paediatricians are entrusted with preventive child care. Only where paediatrics have reached a high level, and have penetrated general medicine can routine measure be taken up by less qualified personnel. Such routine measures usually constitute of a few diagnostic examinations such as measuring, weighing, blood examination, and enquiries into feeding habits. Only where facilities are available for the follow-up and correction of any discovered defects can be made, will this routine be effective. But in a situation like the one in this country, a midwife or a health visitor cannot be trusted to advise correctly on the basis of these simple examinations. She has never been taught, nor could she have been taught, the necessary knowledge, seeing that the doctor himself only studied child health as an undergraduate in the last year of his course, through visiting in the majority of medical schools—for four weeks a children's ward. What he saw there were advanced cases of serious or unusual diseases and he never had a chance to learn the basic essentials of child physiology and pathology. His knowledge of paediatrics is not built upon a solid foundation.

The following table gives a few relevant particulars on the existing facilities for undergraduate paediatric training in 30 out of the 34 existing medical colleges in India. Of the 4 missing in this table, only the Christian Medical College in Vellore has some teaching facilities, while there is little or nothing at the Stanley Medical College in Madras, in Cuttack, and in Aligarh.

Undergraduate Teaching Facilities in Paediatrics in various Medical Colleges in India.

Place	Name of Medical College	No. of children's bed	Designation of teacher	Training in Paediatrics
1	2	3	4	5
Agra	Medical College	20	Lecturer with postgraduate training	4 weeks on the ward and 10 lectures.
Ahmedabad	B. J. College	19	Hon. Physician	6 weeks on the ward and 24 lectures.
Amritsar	Medical College	30	Professor of Medicine	4 weeks on the ward and 20 lectures.
Baroda	Medical College	28	Hon. Physician	4 weeks on the ward and un-specified number of lectures.
Bombay	Seth G. S. Medical College . . .	40	Hon. Physician	3 months on the wards.
Bombay	Topiwalla National Medical College .	25	Hon. Physician	4 to 6 weeks on the ward.
Bombay	Grant Medical College . . .	100	Lecturer with postgraduate training	4 weeks on the wards and 24 lectures.
Calcutta	Medical College	50	Professor of Paediatrics	8 weeks on the wards.
Calcutta	Nil Ratan Sirkar Medical College .	30	Hon. Physician	2 months on the wards.
Calcutta	National Medical Institution . .	18	Lecturer with postgraduate training	8 weeks on the wards and a course of instruction (unspecified).
Calcutta	R. G. Kar Medical College . .	16	Professor of Paediatrics	4 weeks on the wards.
Delhi	Lady Hardinge Medical College . .	30	Lecturer with postgraduate training	3 months on the wards.
Dibrugarh	Assam Medical College . . .	6	Professor in Medicine	A few lectures and demonstrations.

Undergraduate Teaching Facilities in Paediatrics in various Medical Colleges in India—contd.

Place	Name of Medical College	No. of children's bed	Designation of teacher	Training in Paediatrics
1	2	3	4	5
Darbhanga	Medical College	30	Lecturer with postgraduate qualification	6 weeks on the ward.
Gwalior	G. R. Medical College . . .	35	Lecturer with postgraduate training	6 weeks on the wards and 15 lectures.
Hyderabad	Osmania University Medical College .	65	Lecturer with postgraduate training	4 weeks on the ward.
Indore	Mahatma Gandhi Memorial Med. College	40	Lecturer with postgraduate training	4 weeks on the wards.
Jaipur	Sawai Mansingh Medical College .	52	Lecturer with postgraduate training in child health.	4 weeks on the ward and 10 lectures.
Ludhiana	Medical College	30	Lecturer with postgraduate training	4 weeks on the wards.
Lucknow	King George's Medical College . .	20	Professor of Medicine	2 months on the wards and 6 lectures.
Madurai	Medical College	*Nil*	Not available	*Nil*
Mangalore	Kasturba Medical College . . .	21	Professor of Medicine	4 weeks on the ward.
Mysore	University Medical College . .	70	Professor of Medicine	12 lectures.
Madras	Medical College	48	Professor of Paediatrics	4 weeks on the ward and 16 lectures.
Nagpur	Medical College	27	Professor in Medicine	4 weeks on wards.
Patiala	Govt. Medical College	*Nil*	Teacher not yet available	*Nil*

Patna	Prince of Wales Medical College . .	128	Lecturer with postgraduate training	4 weeks on the ward.
Poona	B. J. Medical College . . .	35	Hon. Physician	4 weeks unspecified lectures.
Trivandrum	Medical College	104	Professor of Medicine	4 weeks on the wards.
Visakhapatnam	Andhra Medical College . . .	36	Professor of Medicine	Unspecified period of training on the wards.

It will be seen that in most colleges 4 weeks on the children's wards is all the teaching in paediatrics available—usually in the final year. There are three paediatric teachers with the title of a professor, but only one—in Madras—is full-time, and he is also the only one who has additional staff that can be utilized for teaching (2 paid trained tutors, 3 honorary assistant physicians, 4 postgraduate students and six internes).

In those colleges where a lecturer is on the staff he is usually under the professor of medicine—with the exception of Patna.

Teaching facilities other than "beds" have not been mentioned in the table, as there are no provisions for the use of out-patients clinics anywhere—with the exception of Madras—and well child units are not used for teaching—with the possible exception of Ludhiana.

A certain amount of preventive child care is included in the public health teaching in Vellore and Trivandrum, where students are assigned to the care of a number of families, but even there the value of the teaching is weakened by the unavailability of qualified personnel in the service units.

The present inadequacy of undergraduate paediatric teaching can be summarised under a few headings:

(*a*) There is dearth of qualified teachers and tutors.

(*b*) Far too little time is devoted to paediatrics in the undergraduate training.

(*c*) What little is given, is limited to observation of advanced cases which do not represent even a fraction of the available knowledge of clinical paediatrics, while effective preventive and promotional aspects are totally neglected.

(*d*) There are no adequate training fields. The number of children's beds is small, out-patients clinics are too few and too crowded, and usually conducted by inexperienced junior physicians; and the all important field of preventive care is the domain of unskilled personnel and is not available for teaching at all.

The result is a vicious circle. *There is no service as there is no teaching, and there can be no teaching because there is no service.*

With the weak spots highlighted, the necessary steps for improvement follow almost automatically.

First: a number of qualified teachers for the medical colleges must be trained. It is not sufficient to have a professor or a lecturer, there must also be full-time assistants, fully qualified for teaching purposes. Those assistants as they gain experience and knowledge will become the future lecturers, professors, and consultants. The teaching staff of the paediatric units will also be in charge of the peripheral clinics, which will be dealt with presently.

Second: more time—much more time—will have to be devoted to child health in the curriculum. The revision of the medical curriculum is called for most urgently in order to integrate public health teaching, which in itself already covers various aspects of child care. Here is an opportunity to include more paediatrics. No doubt some theoretical teaching will have to be curtailed, but it seems preferable to leave many theoretical details for postgraduate teaching, rather than to sacrifice the actual imparting of knowledge, without which the medical practitioner is helpless in his daily practice.

Third: the teaching will have to embrace all aspects of child health, and to be given in the appropriate places, *namely mainly outside the paediatric*

ward. Suitable teaching fields do not exist, and will therefore have to be created. Effective service procedures, as already mentioned, are prerequisites of effective teaching.

The teaching of modern paediatrics in western countries developed originally, like all other branches of medicine, in lying-in hospitals. But it was recognised almost immediately that out-patients clinics are more suitable as teaching fields, and already in the beginning of this century one of the earliest pioneers in modern paediatrics—Adalbert Czerny—then in Breslau (Germany), began to concentrate on out-patients teaching, and ran a clinic 24 hours a day in which all his staff took part. Some well child care was included in the activities. It became increasingly clear that the hospital cannot serve as the only, or even major, teaching field in paediatrics. This is in accordance with modern views on treatment in general, whereby stress is laid on domiciliary care the facilities of a modern hospital being used to supplement the necessary diagnostic and therapeutic techniques, requiring elaborate equipment and highly specialised personnel.

There is no intention to state that more children's beds are not necessary in this country (there are at present 20 beds for children per million population in Bombay State, 9 in West Bengal and 6 in U.P.) but only to emphasize that small units such as already exist in most medical colleges, are fairly satisfactory, *provided that out-patients clinics are adequately developed.* The present heavy pressure of patients allowing about 1 minute per case makes out-patients clinics quite unsuitable for teaching purposes. A radical change is therefore necessary. The medical college out-patients' clinics should be converted into consultative units to which only difficult and complicated cases should be referred. This will decrease the load and enable the teachers to study adequately the cases with their students.

Where then will the majority of ordinary out-patients go? The answer to this is that all or some of the child welfare centres, already in existence in most cities and towns where medical colleges are located, should be converted into clinics where both preventive and curative care is given. Most of those centres serve at present a very limited purpose as their full scope is not yet completely developed. The integration of promotional, preventive and curative work in a number of such units appears to be a way to create adequate teaching fields in child health.

While effective teaching is based on adequate service, the service in turn in order to be adequate must be based on research. Knowledge of the major problems of child growth and development is insufficient at present in this country, and whatever information exists it has not penetrated into the service units; also a wealth of material exists in numerous records, which are filed but not studied. Such basic information as normal weights and lengths, average haemoglobin levels, prevalence of nutritional deficiencies and syndromes can partly be collected from available material.

In summing up, it would appear that in order to develop adequate paediatric undergraduate teaching, to meet the needs of the nation, serious reorientation in thinking through appreciation of the importance of child health service teaching and research, rather than major expenses on buildings or equipment is required.

APPENDIX II(3)

SOME TRAINING ASPECTS

OF

INDIA'S MEDICAL MANPOWER PROBLEM

W.H.O. DOCUMENT WHO/EDUC/82

Dated 24th August, 1955.

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SOME TRAINING ASPECTS OF INDIA'S MEDICAL MANPOWER PROBLEM

(Note submitted by the World Health Organization to the first All-India Conference on Medical Education.)

For many years, problems of medical education have intensely occupied teachers as well as university and government authorities in India and a number of studies and reports have been produced by prominent educators. Various conferences dealt with some of the country's relevant problems and foreign experts have from time to time also contributed their comments. Since the publication of the Bhore Report, such additional studies as the report by Alan Gregg, the report of the WHO/USC Visiting Team of Medical Scientists of 1953, the WHO Study on Medical Education in South-East Asia, etc., have become available. Due to all the intense work done on the national plan India was adequately prepared and able to make her full contribution at the international level like, for instance, in the WHO, at the First World Conference on Medical Education in London in 1953, etc.

In the circumstances, the question arises *what is to be expected of the first All-India Conference on Medical Education in 1955?* Its role appears to be at least partly predetermined by all these elaborate antecedents. The outcome of all the preceding discussions, conferences, and surveys is recorded in easily accessible documents and it has to be assumed that the participants of the first All-India Conference on Medical Education would be familar with them. A more repetition of what has already been said over and over again should be reduced to an unavoidable minimum. On the other hand, the most salient points from all the already available material should be chosen for a thorough examination of how they relate to, and what their significance is for, India specifically. Above all, however, it should be explored what action could be taken now on those points, made in preceding discussions, meetings and reports, on whose usefulness and timeliness agreement can be reached. Only if some sort of action programme emerged from the first All-India Conference on Medical Education could it be considered to have been fully successful. If so, this conference would become not merely another stepping-stone but a landmark on the way to more up-to-date medical education in India.

Regardless of whether the medical manpower problem will be an agenda item of the Conference or not, it will nevertheless constantly loom in the background of all deliberations, otherwise they would be divorced from any sense of reality. The purpose of medical education anywhere is to provide the population with the numbers and kind of medical personnel it needs. Any contemplated changes in an existing system can only aim at producing either more or better doctors, and usually both, as is the case in India. There are some aspects of the medical manpower problem that are entirely in the hands of the educators and schools, the solution of others is at least partly within their power and finally there are some which completely escape them. Therefore, *any national conference on medical education must never lose sight of how its deliberations relate to the various aspects of the country's medical manpower problem.* India has to grapple with practically all of its aspects:

(1) the quantitative aspect, having fewer physicians than warranted by the size of the population;

(2) the qualitative aspect, having to adjust an old pattern of undergraduate training to the new needs of the country, and finally;

(3) the distribution aspect, having a high concentration of physicians in the cities and a severe shortage in practically all the rural areas.

Of these three aspects of the medical manpower problem, the Conference could provide at least a partial answer to the solution of (1) by showing what the schools could do to increase the number of graduates if more adequate funds were put at their disposal; it could pave the way to a relatively complete answer to (2), the kind of training given, being almost entirely within the authority of the educators and schools, and it can probably do little, if anything; as regards (3), the problem of the settlement of physicians being entirely outside their jurisdiction.

(*Ad.I*) *The quantitative aspect of the medical manpower problem:*

This question can only be dealt with in the systematic manner warranted if there is close co-operation between government and academic authorities. A realistic estimate of the number of physicians required in, say, five, ten or fifteen years has to come from the government. Since the political authorities determine national policies, including those of health, they are, above all, in a position to access what budgetary priorities are likely to be accorded to health matters among all the other national development plans. However, as soon as such an estimate has been produced it is up to the educators and schools to devise their own plan which would aim at meeting the government's requirements.

This presupposes not only an exact compilation of data on the present "output" of graduates of all the country's medical schools—which, no doubt, already exists—but also a considered appraisal of the potentialities of each school as well as of the national sun total of them. Alternative estimates may have to be made on how great an increase in the number of graduates could be attained at various costs. The government would then have to decide what increase in funds it could vouch for with the necessary degree of certainty or probability. According to that, a plan can eventually be developed as to how the gap between future requirements and the present capacity of the schools could be best narrowed or bridged by the most judicious utilization of anticipated funds.

In certain schools the premises may be adequate but lack of equipment might have to be corrected, in others new construction of buildings may be needed and in most of them the personnel problem is likely to play the dominant role. At any rate, the elaboration of a long-term plan to answer the country's quantitative medical manpower needs suggests the necessity of the creation of a body specifically charged with this task. Nation-wide planning in India is the responsibility of the central government. Most of the medical schools, however, operate under the authority of the States. Whatever machinery may be devised to deal with the problem would have to be so composed as to make certain of co-ordinated efforts at the state and federal levels as well as to be assured of the co-operation of the medical colleges and their universities and of all other statutory or interested bodies that might come into picture. The recommendation made in Part One (General Considerations) of the WHO's Study on Medical Education in South-East Asia regarding the creation in each country of an authoritative national body duly commissioned to prepare a reform in medical education (WHO/Educ/79, Part One, page 27) is therefore pertinent in the particular case of India too. *A government-sponsored nation-*

wide meeting such as the first All-India Conference on Medical Education should not miss the opportunity to give the creation of a "medical manpower commission" due consideration.

(*Ad. 2*) *The qualitative aspect of the medical manpower problem:*

Although it is entirely in the hands of the educators and medical schools to mould the student into any particular type of physician, they nevertheless have to seek some guidance outside the walls of their schools as to which type of doctor they should strive to produce so as to best serve their country's needs. Two of the main determining factors in making this decision are a sound assessment of the country's major health problems and the trend of national health policies aiming at their solution. From all that is known on either score in India two conclusions seem to offer themselves :

(i) the solution to all the major health problems of the country lies in the realm of prevention rather than cure ;

(ii) the government, cognizant of the predominantly rural character of the country and its needs, is placing particular emphasis on rural community development.

Unless the medical schools took these two fundamental facts into consideration in adjusting the kind of training they give, they might not shoulder the full responsibility which is theirs in the country's national development programme. *The first All-India Conference on Medical Education would be the appropriate occasion to examine what adjustments may be required in order to arrive at a certain re-orientation in the teaching of medicine from the purely individual curative approach to a more preventive, community-minded one which is a paramount need in medical education in India.* In examining this difficult problem at least three pertinent approaches should receive attention:

(*a*) organizational measures:

The most important one is the establishment of departments of preventive (or preventive and social) medicine. The Indian medical colleges are by now well on their way to take this step, however, the creation of such departments in itself does not yet solve the problem. The crucial point is to make them integral parts of the schools by establishing close working relations with all the other departments and avoid being isolated as is, unfortunately, the case not so infrequently. Only so will teaching become practical enough to enable the young graduate to make a concrete contribution to the promotion of better health in his community. Even the best course taught by an isolated department of preventive medicine is bound to fall short of its objective, whereas a department that has been able to generate active interest in its work and secure the co-operation of the other departments is likelier to be successful in the end, even if its own course were much less elaborate. *The first All-India Conference on Medical Education might explore how the various pre-clinical and clinical departments could assist in furthering the efforts of the department of preventive medicine and thus the preventive orientation of the medical student.*

(*b*) curriculum adjustments:

These may best be explored under a series of sub-headings, even though they are all closely inter-related:

(*aa*) What subjects should be taught?

This is probably the least controversial aspect of whatever changes may have to be made in the curriculum and yet, there are bound to be divergent views on the matter. Not so much as regards the teaching

of most of the main "traditional" subjects, such as anatomy, physiology, Pathology, internal medicine, surgery, obstetrics and gynaecology, etc., nevertheless they do present some problems. Paediatrics, for instance, which with internal medicine, surgery and obstetrics and gynaecology, should rank among the "Big Four" in the clinical curriculum is still struggling for full recognition in India. Specialty subjects such as ophthalmology, dermatology, otorhinolaryngology, psychiatry, etc., which in most schools of the world constitute traditional courses of their own, have yet to find their well-balanced place in the curriculum of many of India's medical schools. The subjects of public health and medical jurisprudence (forensic medicine) also warrant renewed consideration. Besides these questions, however, there are also those which deal with the inclusion into the teaching plan of such relatively new subjects as preventive medicine, (medical) sociology, statistics and biometry, epidemiology, anthropology, genetics, psychology, etc. In finding the answers to this maze of questions some guidance is provided by the two main conclusions arrived at in regard to the qualitative aspects of India's medical manpower problem (page 6, Ad. 2 (i) (ii)).

If the young doctor is expected to fulfil his role in the field of prevention he has to be taught preventive medicine. The establishment of a department, such as outlined above, will already go a long way towards the envisaged goal. However, there is also another angle to be considered, namely, how to make the student sufficiently receptive The teaching of preventive medicine as well as of public health will only become fully effective if the student's mind from the very beginning will not be exclusively directed towards the individual-curative care of his patients but also towards his future communal responsibilities. The crucial point in the matter is that neither the pure nor the applied natural sciences provide the answers to many of the social or socio-medical problems which the physician is up against in practising both curative and preventive medicine. The teaching of certain subjects outside the realm of the applied natural (and mainly biological) sciences, belonging more to the domain of the social sciences, might however provide him with a more adequate armamentarium in this respect.

If the young doctor on graduation should also be particularly suited for rural practice in the general framework of the country's rural community development programme it will be good to keep this requirement in mind too in making an expedient selection of subjects. The rural practitioner farther removed from specialized hospital facilities than his urban colleague has to know how to deal with emergencies which the general practitioner in or near the big cities can easily transfer to the care of specialists. This point of view should be heeded by slanting the contents of all courses accordingly, but it might also have some bearing on the selection of the subjects proper.

The first All-India Conference on Medical Education could in principle arrive at some conclusion as to what subjects should be taught and particularly what subjects should be either changed, added or given greater or lesser emphasis in meeting the country's qualitative manpower needs.

(*bb*) How many hours to the various subjects ?

The amount of time to be allotted to a certain subject depends on the contents of the course and on the degree of emphasis to be put on it. Any agreement reached on the allocation of time is, as a rule, a compromise solution,

arrived at by lengthy bargaining because of the contending claims of the different chairs for the limited amount of teaching time available. Therefore, *the problem of time allocations to subjects does not very well lend itself to treatment in large meeting except for establishing the general principles to serve as a guide towards reasonable uniformity.* The details of how much time is to be given to the different subjects sholud preferably be dealt with in small committees.

As soon as agreement is reached on the need for introducing a new subject, the approximate minimum time required for its teaching should also be determined. It is not enough to say, for instance, that from now on instruction should be given in preventive medicine, medical sociology and statistics too, but it also has to be stated how much of these subjects should be taught. The new subjects will probably have to draw on the teaching time of the old ones and there has to be a good appreciation of the resulting strain on the latter in having to readjust their teaching to whatever reduced number of hours they may eventually be given. This is inextricably linked with the question of the contents of the different courses which will be dealt with below.

In order to find the time for new subjects without unduly lengthening either the working hours of the day or the length of the curriculum as a whole, one of two procedures may be followed: the hour allocations for the old subjects may be reviewed first, in order to find some teaching time for the new ones which would then receive whatever number of hours may have been wrested in the inevitably preceding bargaining from the old-established chairs. As already implied, this procedure is not to be recommended. The preferable alternative is to determine first the time needed for the new subjects and then set out to find it by reviewing the hour allocations of the old courses accordingly. If the reasons for the inclusion of new subjects are sufficiently valid then the minimum time needed for their effective teaching should be provided. It is realized that in the past new subjects sometimes had to be initially satisfied with a token allocation of time and eventually gained more and more as the need became increasingly obvious. This may easily be the case with one or the other new subject now under consideration. Such precedents must, however, not be applied to the subjects of preventive medicine and public health. In view of their overriding importance in India and the high priority which their teaching has to claim, it is a cardinal problem to provide the necessary minimum of hours for their instruction when re-allocating teaching time to the various courses. As a basis for any relevant discussion the equivalent of three full months of teaching time, judiciously distributed throughout the length of the undergraduate curriculum, is suggested.

A reduction in the number of hours allotted to a subject may be made for various reasons. It may be due to the realization of the subject's diminished importance and this is, for instance, how mineralogy vanished from the curricula of old. It may happen because a more expedient re-arrangement of the material has been found, as happens, for instance, in cutting the total number of hours given to zoology and botany and by uniting the two courses into a single subject, such as general biology with a resulting saving in teaching time. A reduction in the number of hours given to a subject may express the intention to give fewer details as seems, for instance, to be the present trend in omitting some of the minutiæ in the teaching of anatomy. Finally, the number of hours can be cut if it is found possible to have only part of the material in a subject presented by the teacher leaving it to the student to learn the rest of what is required for text books. *The Conference could in a general way indicate for*

what reasons it may be possible to cut the number of hours in certain subjects so as to gain the necessary teaching time for whatever new subjects it may recommend to include.

(*cc*) What should be taught in the various subjects ?

The time when students could be taught all or most of what was known in a subject, has passed long ago. The vast increase in knowledge brought about in the last few decades has reduced the material which can be given to undergraduates to a fraction of what is known. Therefore, in redrafting the undergraduate curriculum in the light of mid-twentieth century knowledge may of the necessary additions have to go hand in hand with omissions from the teaching material of what has become obsolete and of historical value only. There is, undoubtedly, didactic merit in discriminately teaching some of the out-dated and the historical. However, there is also a limit beyond which the law of diminishing returns makes itself felt when crowding too much into any single course. The time has therefore come to review the contents of the various courses and the following two general principles may perhaps indicate an auspicious approach towards their re-adjustment.

Undergraduate training should not aim at giving the student encyclopaedic knowledge but must strive to teach sound scientific reasoning while imparting the fundamentals of any particular discipline. The student must be made to realize that there is a great deal he has to learn himself and that the study of medicine is a life-time occupation. Graduation from school, although a milestone, is anything but the end of the road. As long as the undergraduate had been taught in school how to think critically and scientifically and how to go on learning on his own, it will not matter too much whether or not he has been given fewer details in one subject or another.

On the other hand, he should be given in his medical school courses as much practical instruction as is possible in all which is essential to a general practitioner. That is to say that a student need not learn all about the various forms of congenital malformations of the heart or about the technique of a sub-total gastrectomy. He will either know how to read up on such matters if he had been taught as suggested or will have to learn such techniques, as a post-graduate, much more thoroughly if he wishes to practise them. He should, however, learn in medical school, for instance, a great deal more about diarrhoeas in infancy or minor surgery than is the case at present.

By bearing in mind that in all teaching the soundness of scientific reasoning is paramount it will be avoided that instruction decline to a mere vocational level and by concentrating on the practical it is likelier that the young graduate will receive more adequate training for his future practice than is given now. Undergraduate training will thus equally prepare him for general practice, specialization, or a scientific career ; whichever he may choose he will have to go on learning after graduation all the same. *The first All-India Conference on Medical Education may, therefore, give consideration to the problem how increasing practical instruction on a sound scientific basis may be promoted in redrafting the undergraduate curriculum.*

(*dd*) How to teach ?

There is no generally accepted best method of how to teach medicine and no method—as successful as it might be in one place—is automatically applicable to all others. Whatever foreign examples may be used in any teaching reform have to be adapted to the local conditions such as deep rooted teaching traditions, the type of secondary education, available teaching facilities, financial

resources, etc. Since pedagogical views have been undergoing a certain change in recent years the question of how to improve teaching techniques in India is a timely one.

Some of the new ideas concern the entire "strategy" of undergraduate education and are called by such names as "integrated teaching" or "horizontal teaching" as contrasted with the traditional "vertical" outlay of the curriculum. Most of the efforts made in this direction are still in the experimental stage and the results remain to be seen. Medical schools not yet too firmly established in their present teaching pattern may not benefit from an abrupt change, but the old-established schools and the entirely new ones might stand a better chance if and when any such educational experiments should be decided upon. By no means should, however, the search for new and better teaching methods be discouraged in India, provided it derived its inspiration and originality from the local conditions instead of following the temptation of copying what may appear to be the fashionable elsewhere.

In contradistinction, progress in what may be called the "tactics" of teaching is more convincing and has also resulted in a greater consensus of opinion. In general, exclusively or predominantly didactic teaching is in disrepute but the pendulum has also swung back from the other extreme in which lectures were for all practical purposes to be discarded altogether. The prevailing trend aims at a balanced combination between teaching in big lecture theatres and in small groups, between ex-cathedra teaching and the seminar form of discussion technique, between text book memorizing and practical laboratory or ward instruction, etc.

It is generally preferred that the student do and see things instead of merely being told about them. Thus in the individual courses important changes have been made: teachers in anatomy, for instance, are making increased use of X-ray pictures; in physiology they prefer observations on the human body to some of the former demonstrations on animals and, in these again, increased work on mammals is replacing or reducing the role formerly played by the frog. Similar trends exist in pharmacology; in pathology, wherever the subject is not completely identified with morbid anatomy, the interest is not exclusively focussed on the corpse but livelier contacts with the clinical departments have introduced elements of experimental and clinical pathology into the teaching. In the clinical sphere, not only has ward instruction gained importance but even outside the wards and the hospital, the out-patient department, health centres, clinics and other field facilities including the homes of patients, are being included in the technique of clinical instruction as the significance of the psychological and social components becomes more appreciated and as the influence of the preventive approach enters more and more into the picture.

The All-India Conference on Medical Education might usefully consider what improvements in teaching techniques would be best suited to promote the aims of the curriculum.

Examinations are nothing else than one of the techniques of teaching and may also be considered in this connexion. Wherever the failure percentage is excessively high—as is the case in India—fault has to be found either with the selection of students, the examination procedure or with the teaching. In analysing the problem teachers must, therefore, look at themselves just as critically as they are apt to look at their students. Whatever the customary examination technique may be in any school or country, none is full proof of the student's fitness and it should not be judged by the outcome of any one formal examination alone. The results of continuous observations of the

student's aptitude throughout the entire duration of the course should strongly supplement the information that any formal examination may yield. It is as much of a mistake to make the student learn primarily "for the examination" as it is to make it no more than a test on his memorizing capacity. Too much time and energy is spent in India to overcome the hurdle of the formal examination which is over-rated in its importance and out of perspective with the educational goal. There are probably, some deep-rooted reasons for the examinations being such as they are in India and because of them any changes to be made might have to take them into consideration, however, there is little doubt that the present system needs thorough overhauling and *the Conference should make a critical review of the whole problem of student examinations from all angles that have bearing on the present high failure rates.*

(*Ad. 3*) The *distribution aspect of the medical manpower problem:*

This aspect is concerned mainly with a more equitable distribution of the country's physicians between urban and rural areas. Educators and teaching institutions neither have jurisdiction as regards the place in which their students settle after graduation nor as regards the type of work they may engage in. Only the government can devise enforceable measures to improve the present situation and, since the relevant decisions belong more to the political realm than to the educational one, *the distribution aspect of the medical manpower problem appears to be outside the scope of the Conference.*

The medical schools are, nevertheless, interested in this aspect for more than one reason. If, for instance, at any future date the government should decide to require a certain length of, say, rural medical service from every young graduate before granting a licence to practice—as is the case in some countries—the schools would have a more definite mandate to orient their teaching accordingly.

Another distribution question of interest to the schools is how to secure sufficient numbers of full-time junior personnel for their staff from among the young graduates. This is primarily a problem of economics and cannot be solved without government action and support either.

The teacher training programme:

Among the many problems India's medical schools have to contend with, two closely inter-related questions seem to stand out as being of prime importance for the future of medical education in the country; the training of adequate numbers of teachers, and the promotion of research. Although the first All-India Conference on Medical Education may not deal in detail with these two questions specifically, they do nevertheless provide the background against which the future of medical education in India has to be envisaged. The situation as regards either of these two problems is not unfavourable because the essential prerequisites for their solution do not have to be created any more they already exist. Moreover, the government and academic authorities have already taken a number of effective measures to cope with them, and outside assistance may expedite these efforts. The expansion of the old schools, the creation of new ones and the rise in the quality of teaching in both make the problem of teaching staff a particularly urgent one.

There is an appreciable number of highly qualified teachers (and research workers) in various disciplines in the different medical schools of the country who, if duly supported, are capable of training all grades of teaching personnel

including their own successors, but many more are needed. Through the efforts of the Central Government, a new and better remuneration system for full-time teachers is beginning to replace the old one, and although a great deal remains to be done to make teaching careers more attractive, it seems that the economic disadvantage to them is likely to diminish as time goes on. The upgrading of certain departments in the medical schools of India is yet another step in the right direction, but much depends on how these departments will function and what support they will receive if they should live up to expectations. The All-India Medical Institute will finally mark a great step forward when it starts functioning, it is hoped, a few years hence.

Assuming that inadequate remuneration will gradually cease to be a deterrent to full-time teaching careers, the point to concentrate on is to make the upgraded departments and later the All-India Medical Institute yield as good crops of teachers as possible. The essence of the system of upgrading is that a limited number of departments are charged with the responsibility of training teachers to meet the national demand. This holds true just as much now as it will when the All-India Medical Institute will function. Implied in this system is the realization that at the present time not all the departments are capable of training teaching personnel which is the distant goal to strive for. Only in those countries where practically each and every department trains successors to the incubents in the normal course of their daily routine, has the shortage of teachers been overcome. It does not matter that there is always a natural migration of assistants and professors among the medical schools because, in the end, as many departments train teachers as need them and essentially the national yield balances the national demand. *Therefore, the system of upgrading departments—as at present practised in India or as it will change with the establishment of the All-India Medical Institute—is likely to ease but not to solve the problem for many years to come.* As the number of upgraded departments increases, conditions as regards training opportunities for teachers will more and more approximate the situation which at present exists in the countries with old-established academic traditions.

Besides these numerical considerations, the way of how teachers are usually trained also has to be borne in mind : in this respect, in advanced countries, formal post-graduate instruction plays an insignificant role, it being almost exclusively reserved for the training of practising physicians, either general or specialist. The future professor is usually raised by "in-service" training, by what may be called on "apprenticeship" at a high level, and the main method by which he is trained is research work. By such training he is expected to acquire profound enough knowledge of his subject, the degree of maturity in critical scientific reasoning, the independence and originality of thought, which are generally considered the characteristics of an academic teacher. Amazingly enough, the prospective professor has, in the past, received very little, if any, training in the art of teaching and in most instances his scientific record determines his eventual appointment to a senior teaching post. Only recently, due to the wider use of the tutorial type of small group teaching, have junior departmental staff been given a better opportunity to learn how to teach, and some future professors are therefore now undergoing an apprenticeship not only in research but also in teaching. Nevertheless, *research remains the indispensable road which leads to the qualifications of a professor and therefore it should be made a matter of national policy to foster research in all upgraded departments.* It would be desirable if there existed in all of them the "scientific climate" in which future teachers should be raised, and that can only be the case in places where research is being done. The teachers emanating from such departments

will then carry the spirit of scientific investigation to their new teaching posts, and will gradually raise them from the vocational to the academic level and make them eventually fit for upgrading.

The informal "in-service" type of raising teachers by apprenticeship and research training does not yield great numbers. Academic teachers can hardly be mass-produced, and least of all by this technique. They are the products of long years of post-graduate maturation and of a great deal of personal attention given to them by their seniors throughout these years. If India relied on this technique alone there would probably be an acute shortage of teaching personnel for generations to come.

On the other hand, India—because of the high scientific standards already reached by many of her teaching and research institutions—cannot any more avail herself of such short-cuts as may be condoned elsewhere in the absence of more suitable alternatives. In relatively primitive circumstances, or conditions not far removed from that stage, a practitioner with only inadequate knowledge or antiquated training or with no special training at all, may for instance be charged to teach a pre-clinical subject; a successfully completed one or two years' fellowship may qualify for a chair. "Solutions" like that are out of the question in India. The quality of teaching and research conducted by her leading institutions commands to all others—if not entirely their own highest scientific standards—a certain level nevertheless, below which they cannot afford to descend. Thus, at the present time, *India finds herself in a situation where the pattern of teacher training traditionally followed in the very advanced world is too slow to cope with her needs, and the relatively fast procedures acceptable at the other extreme are too primitive to meet them.* This is clearly an interim stage which calls for devising a system which should be a speeded-up version of the advanced pattern of teacher training without trading too much quality for time.

Unfortunately, even in most of those departments where there are professors of the highest qualifications, the junior staff is so inadequate that the senior man, overloaded by administrative and teaching responsibilities, cannot find enough time to do research himself and/or guide and supervise his disciples in whatever research they may attempt to engage in. In the first few years of upgrading, this situation will even be aggravated by the fact that he will not yet have been able to train an adequate junior staff and will have to look after a larger number of disciples because of the upgrading. Therefore, if these departments are to be productive, the professors in charge need help; they either need a very senior local associate or assistance from the outside. Since adequately trained senior local associates, if and when available, are likely to be drained off very soon to take over chairs themselves, the visiting professor is apparently the most suitable solution at this stage. If at least some of the upgraded departments had the benefit of the presence of a visiting professor who would concentrate on research, a great deal would already be gained both in quality and in time.

Although the above suggested type of employing visiting professors is not quite unorthodox, it is nevertheless true that—except for the very advanced parts of the world—they are, as a rule, used to make up for lacking or not wholly qualified local teachers. Only exceptionally would a visiting professor be sent for any length of time to a school where a fully qualified local professor is already on the spot. The presence of a visiting professor in upgraded departments for the purpose of stimulating investigative thought and of training future teachers in research techniques would somewhat modify the purely "in service"

or "apprenticeship" scheme of training. He would not only discuss with and advise and assist all members of the department's staff in the details of their particular research, but would also give more or less formal instruction on advanced topics in the specialty, have demonstration classes in advanced experimental methodology, help in establishing regular scientific staff meetings, *ad hoc* discussion groups, etc. Some of the professors of other universities of the country could also be drawn into these activities; instruction in new experimental techniques, for instance, may benefit not only future teachers but also the already established ones. Corresponding to what was called above the interim stage in the evolution of India's scientific institutions, these *upgraded departments should function somewhere along a line between format post-graduate instruction and the informal "in-service" type of training post-graduates.*

The simultaneous presence in the country of a number of visiting professors over a prolonged period may be further used, for instance, to enliven national scientific meetings, to initiate and/or foster contact among departments and schools, to organize specialized lecture course, etc.; they would add a number of new elements to the upgrading scheme.

Before undergoing training in an upgraded department with a future teaching career in view, the young doctor should at least have had two years of preliminary—preferably clinical—training. Training in the upgraded department may be envisaged of two or three years' duration after which a one or two years' fellowship abroad may round out a, say, six year period. This is probably the minimum time in which a young doctor in India may attain a qualification roughly comparable to what is, for instance, in European universities, the granting of the "venia legendi" with an academic grade such as "Privat Dozent" or "agrege". Although a person so trained is not yet by any means qualified for the senior grades of professorship, he can very well teach and even act, if need be, as temporary head of a department. The grade of full professorship should be reserved only for a later stage when at least four or five years of experience lead to adequate professional maturity. If such were to be approximately the qualifications required for future professorial appointments an estimate of the prospects of the upgrading scheme may be attempted along the following lines; few, if any, Indian medical school departments could, in the foreseeable future, provide more than ten to twelve research places for their staff. Since the present establishment of assistants varies on an average between three or five, the maximum number of additional trainees who could be admitted per department would be around seven. Furthermore, since these trainees would have to spend from two to three years in the department the annual number of admissions would have to be two to three physicians so that in a two to three year period, the number of trainees would reach a total of seven. This slow rise in their number would also allow for a gradual expansion of the departments. These figures also imply that at least two and probably three up-graded departments would be needed in each specialty. For instance, *by admitting seven young doctors annually to training in up-graded pre-clinical departments, it would take approximately seventeen to twenty years to provide each medical school in the country with one senior-ranking professor in the respective subjects* whereby allowances have been made for deflections to other subjects, mortality and unforseen happenings. It would be necessary to employ from twelve to eighteen visiting professors over a period of five years at least, and their number could be gradually reduced later on when some of the local personnel mature.

The upgrading scheme, if developed into a more comprehensive training system such as is being tentatively outlined, would greatly influence and put considerable strain on the country's fellowships' programme: over a period of ten years at least, the foreign training of the doctors admitted to upgraded departments would, in the pre-clinical specialities alone, amount to approximately eight fellowships a year. Similar estimates might be easily made in the clinical ones too. All this might entail a careful revision of the fellowships' selection practices. In the clinical field, the emphasis should probably be on introducing and/or developing essential narrower specialty subjects such as haematology, gastro-enterology, endocrinology, neurosurgery, orthopaedics, urology, etc.

It is realized that whatever long-range teacher training scheme might be devised and whatever estimate might be arrived at as regards its prospects will be subject to unforeseen or unforeseeable, favourable or unfavourable developments. However, be that as it may, one practical general conclusion can at least be drawn from such planning, namely, that any contemplated changes in medical education have to take into consideration all the complex elements on which depend progress and success of the teacher training programme. They require permanent attention, adjustments, revisions and considerable efforts in all respects and *somebody clearly has to assume responsibility for all that.* Since so many diverse national interests have to be heeded and reconciled in any action to be taken, the already suggested creation of a "medical manpower commission" seems to become inescapable if a "laissez faire" attitude is not to prevail. However, if the creation of such a commission amounted to no more than to add just another committee to the already existing ones, it would be better to do without it. Without sufficient authority it could not fulfil its role.

Medical education is not only a problem of the medical profession, as is sometimes erroneously assumed, but also a concern of the government and of the public at large. There will probably be less difficulty in India to recognize educational needs, define training goals and evolve schemes to reach them than to establish the organizational and administrative machinery to translate them into reality. The medical educators are, no doubt, best qualified to explore and state what changes should be made and they themselves may implement some of them in their own schools without any action by the government. For many others, however, the political authorities will have to make the legislative and executive provisions, budgetary and otherwise. As conscious as the medical community has to be of its overwhelming contribution in changing the country's pattern of medical education, it also has to realize its limitations. If so, the imperative need for close collaboration among all interested persons, organizations, institutions and agencies becomes obvious. If all at present overlapping or conflicting interests could be made to work together in an overall planning and directing body, the chances are that the ensuing changes in medical education would not cling too much to the traditions of the past, would not be unduly influenced by some of the extraneous experiments of the present, but would do justice to the needs of the new India in the future. A representative national gathering such as the All-India Conference on Medical Education might therefore enhance the prospects of its recommendations by contributing not only to a more profound understanding of the pedagogical and organizational problems involved, but also by advancing co-operative spirit without which little progress can be made in a setting as intricate as that of the Indian national scene.

APPENDIX IV

FORMATION OF AN ASSOCIATION OF MEDICAL COLLEGES OF INDIA

AND

CERTAIN SUGGESTIONS FOR CONSIDERATION BY THE MEDICAL EDUCATION CONFERENCE

(19th to 22nd November, 1955)

BY

K. C. K. E. RAJA

MEDICAL EDUCATION CONFERENCE FROM THE 19TH TO THE 22ND OF NOVEMBER, 1955.

Certain Suggestions for Consideration by the Conference

By

K.C.K.E. Raja,

Officer on Special Duty, Ministry of Health, Government of India,

and

Secretary, All-India Institute of Medical Sciences Committee.

In the last paragraph of Chapter V of the Memorandum (Medical Education Conference VI) which gave a résumé of the proceedings, on the 19th and 20th of September, 1955, of a Joint Committee which discussed the reports of the three Sub-committees that had prepared the material for the Conference, the following suggestions were put forward:—

(*a*) The creation of such conditions as will facilitate experimental studies and research in medical education is necessary.

(*b*) There is need for consultation, on a wide basis, in regard to different matters relating to medical education. Provision should therefore be made for establishing committees for specific purposes and for calling together in conference, from time to time, medical educationists and other interested in the subject.

(*c*) It is desirable that some form of permanent machinery should be established for ensuring that the interests of medical education in India are looked after the understanding and sympathy and that co-operation is promoted between the various authorities responsible for improving its standards and maintaining them at a high level.

(*d*) Sufficient funds should be made available for the achievement of the above-mentioned objects.

2. The purpose of this note is to discuss the idea set forth above and some other matters and to offer certain suggestions for consideration by the Conference. This Conference is being convened at an opportune moment. Medical education forms a part of the wider field of general education, in which extensive changes of a significant nature are in progress. The ideas embodied in the concept of Basic Education and the proposals of the Mudaliar Commission on Secondary Education have brought into concrete shape the fruits of prolonged thought and discussion by the educationists of the country. The Government of India, in consultation with the highest educational authorities in the land, has accepted the changes that have been proposed and their implementation has started. The Conference on Medical Education is therefore being held at a time which makes it possible to focus attention on the inter-related problems of general and medical education and to make such recommendations as may be deemed desirable to modify the preparation of the prospective student for the programme of medical training, which the Conference will put forward for

acceptance by the country. The widespread interest that exists for educational reforms should act as a stimulus to the Conference to approach its task of reshaping medical education boldly and with the confidence that its recommendations will secure support from the authorities responsible for their being carried into effect. Further, the successive Five-Year Plans, which form the country's method of promoting action for a progressive realisation of improvement in all matters beneficial to the interests of the people, hold out the promise that none of the important recommendations made by the Conference will fall to be taken up and implemented for lack of funds.

3. The inauguration of the Conference is equally opportune from another point of view. Considerable interest in the re-organization of medical education is being taken in a number of countries and a variety of experimental studies is in progress in those countries. India cannot afford, in her own interest, to ignore these developments; she must take full note of them as well as of her own special needs and then attempt to solve her problems of medical education as intelligently as she can. The Conference offers a unique opportunity for the study of these problems.

Experimental studies and research in medical education.

4. The reports of three Sub-committees and the discussions on these reports that took place on the 19th and 20th of September 1955, which were embodied in a résumé already circulated to the delegates of the Conference, provide a number of subjects on which further information should become available before appropriate action can be taken. An example is the difficult task of devising suitable methods for assessing periodically the student's progress during his course of training. Such methods must fulfil the dual purpose of enabling him to face the tests that are employed with equanimity and not with fear or distress and of ensuring, at the same time, that these tests record correctly the response the student makes to the courses of study he undergoes. Another is in connection with the suggestion which Sub-committee II has put forward that written examinations should be dispensed with. What will be the effect of its elimination and of its replacement only by oral and practical tests? Will the latter prove to be as efficient as the simultaneous use of the three types of tests? Other problems are questions such as integrated teaching, the imparting of a bias to the training programme so as to equip the future medical practitioner to meet the special needs of our rural areas and the promotion of a social outlook in him and of a spirit of service. These and other related problems all require study on a factual basis before proper answers can be formulated.

5. Study and research into the problems of medical education should be undertaken, if they are to be fruitful, by the teachers themselves in their medical colleges. Such investigations require at least two conditions to be fulfilled. One is the supply of adequate funds, the other is the creation of the necessary atmosphere of freedom to experiment within such limits as will not materially affect the efficiency of the training to be imparted to the students. It may be expected that lack of funds will not prove to be an impediment. On the other hand the question of creating the proper atmosphere for experimental studies requires serious consideration.

6. The views that are given in the following paragraphs are the personal views of the writer of this memorandum and may not reflect, in part or in full, the views of Government which he serves. He has also to admit that he is but a medical educationist, his experience of teaching having been limited to a

period of three and a half years in the specialised field of Epidemiology and Statistics. But he has been interested in the problems of medical education for many years and the views expressed here are being offered in the hope that they may provoke constructive thought among the distinguished leaders of medical education assembled at the Conference.

7. Universities are the authorities which are responsible, under the Constitution of India, for regulating education, including medical education. It is therefore within their purview to prescribe courses, qualifications for teachers, standards of equipment and accommodation and various other matters which help to promote sound teaching. Education, including Universities, is an entry in the State List of the Constitution and therefore it is State Legislatures that are empowered to enact laws regarding education and the functioning of universities, although in the case of certain institutions of national importance Central legislation has created bodies with the powers and functions of universities. While this is the general position, in regard to medical education additional provision exists for regulation in an indirect way. A Central Act created in 1933 the Medical Council of India in which is vested the power to recommend to the Central Government the granting of recognition to such 'medical institutions' as are, in its opinion, conferring medical qualifications of the standard that is considered satisfactory by the Council. Under this Act 'medical institutions' are the universities and other bodies that grant medical degrees and diplomas which form the basic qualification in Medicine. In order to carry out this function the Medical Council of India has been empowered to call for information from 'medical institutions' regarding courses of training and other relevant matters and to send Inspectors and Visitors to the medical colleges to report on the state of affairs existing in them. The reports of the Inspectors are public documents, while those of the Visitors are confidential reports for the information of the President of the Council and the Council itself. These Inspectors and Visitors may attend the examinations that are carried out in the universities for qualifying candidates to the grant of degrees, but they are not permitted to interfere in any way with these examinations. With the information made available to the Council in these different ways it is expected to make up its mind regarding the nature and quality of the training given to the students and to recommend to the Central Government the grant of recognition to a medical qualification which is not on the Schedule of qualifications incorporated in the Act, to advise against the granting of recognition wherever necessary, or, in the case of a qualification already on the Schedule, to suggest its deletion if the standard of training is considered unsatisfactory. The grant of recognition to qualifications and their inclusion in the Schedule of the Act are very much prized by universities and medical students, because it is only the possession of recognised qualifications that enables doctors to enter public service in this country or to secure freely the advantages of post-graduate training in foreign countries.

8. The Medical Council of India was created by Central legislation with the limited powers indicated above, presumably for the purpose of not interfering with the rights of universities to regulate medical education in all its details through the exercise of such powers and functions as may be bestowed on them by State legislatures and State Governments by means of appropriate legislative and administrative measures. The Medical Council of India was evidently created to promote, only in an indirect way, a rise in the standard of medical education. In practice, however, the position has changed during the past few years. Instructions regarding the qualifications for teachers, strength of staff, equipment and curriculum have been issued by the Council in the form of

'recommendations' to universities. The use of the word 'recommendations' is supposed to cover such legal flaws as may exist in the Council trespassing into the region of detailed regulations of medical education, which is within the sphere of functions of universities. The strong desire on the part of universities and of students to ensure recognition being given to their medical qualifications and to have such recognition continued was referred to earlier. The reports of Inspectors and of Visitors sent by the Council will naturally be biassed by the nature and contents of the 'recommendations' issued by the Council, with the result that a shift is probably taking place in the exercise of detailed regulation of medical education from universities, the bodies in which law has vested this responsibility, to the Council which is not expected to carry out this function. It is not the purpose here to discuss the merits or demerits of this transfer of functions. But it would be wrong not to give expression to the fear that a measure of rigidity is being introduced into the programme of medical education, which may militate against the development of experimental studies, the need for which was indicated earlier in this memorandum and was expressed clearly at the Joint Meeting on the 19th and 20th of September this year.

9. It is desirable that the Conference should take note of this situation, give adequate thought to it and propose such action as may be considered necessary. Certain suggestions in this connection will be offered later in this memorandum.

The need for consultation on a wide basis for the improvement of medical education.

10. The medical faculties of universities and the Medical Council of India have, in the past, given thought to certain aspects of medical education such as the curriculum, the qualifications necessary for teachers and similar matters, but no attempt was made to consider such important aspects of the problem as the need to re-orient medical training to give the student a picture of health and disease as the result of the interaction between the individual and his physical and social environment or to acquaint him with the social functions of Medicine and thus prepare him for his future obligations and opportunities of service to the community, in which he lives and works. It is essential that, if discussions on such problems are to prove useful, teachers of medical colleges should be encouraged to take part in them. As far as the writer is aware, the first occasion on which such a meeting was arranged was in March 1955 when a Conference on Preventive and Social Medicine was convened under the auspices of the Rockefeller Foundation, and teachers of this subject from a number of medical colleges and some others were given the opportunity to discuss the problem in its different aspects. The preparatory work done by the three Sub-committees, the discussions that took place at the meetings on the 19th and 20th of September this year and the Conference scheduled to meet on the 19th of November, 1955 constitute other examples of a broad-based attempt to deal with medical education. It is urged that such opportunities for participation in discussions by a wide circle of people interested in particular aspects of the subject should become more frequent in the coming years.

11. It may prove helpful to compare the procedure in India for regulating medical education with the practice prevalent in the United States of America. In India, as in the case of the United Kingdom, a statutory body, the Medical Council of India, exists for promoting the maintenance of certain minimum standards, although universities are responsible for the detailed regulation of the courses of training given in the medical colleges affiliated to them. In U.S.A., on the other hand, no such co-ordinating body exists with powers conferred on

it by legislation. The Association of American Medical Colleges, in consultation with certain other medical organizations, takes the responsibility, at its annual meetings, to explore in detail various aspects of the whole problem of medical education and thus to set forth, before the country, ideas and ideals towards the fulfilment of which all educational authorities may strive. Thus the motive force behind the improvement of standards in U.S.A. operates from within the professional bodies themselves and not through the exercise of powers which a statutory authority possesses for regulating medical education. One result of this may be that, while progressive medical schools will undoubtedly seek continuously to reach higher levels of medical teaching, an approach towards uniformity of standards by all schools might be wanting. In India can be strengthen the existing machinery for promoting standards by the provision of an extensive system of consultations, whereby the growth of medical education will be influenced and strengthened by contributions from as wide a circle of people as can be encouraged to provide their share to constructive thought on vital matters?

12. In this connection it seems appropriate to refer briefly to the Teaching Institutes—a system of annual conferences—which the Americal Association of Medical Colleges has promoted to explore in a comprehensive way the whole field of medical education. Certain remarks of Dr. George Packer Berry, Dean of Harvard Medical School, who is the Chairman of the Committee on Planning for Teaching Institutes, are quoted below to show the purpose of these conferences:—**

> "The Teaching Institutes are envisioned as instruments for helping us to extirpate from the curriculum what has become archaic, add what is now of significance, in order to restructure it around an essential scientific core consonant with advancing knowledge. Without minimising any of the scientific aspects of medicine, we hope to find ways enabling medical students to acquire a better understanding of the total patient in keeping with the mounting conviction that psychological and environmental factors are of consequence in health and disease."

> "Our preoccupation with scientific medicine has tended to let the patient fade into a faceless, nebulous creature, often no more than a number on a test tube or an entry on a chart. Such an attitude is not consistent with the best medicine. Moreover, it is not 'scientific'. While the student is learning a great deal about the patient's 17—Ketosteroids, undeniably important, he tends to overlook the patient's anxieties and hatreds in his family setting and the pressures that hem him in. These, too, are important. They must receive greater attention."

13. To meet the situation a re-organization of the teaching programme may be necessary which goes beyond a rearrangement of the curriculum or additions to and subtractions from its total content; it may require a change from compartmentalized teaching to an integrated presentation to the medical student, by different departments of a medical college, the basic facts and principles relating to man's structural and functional growth and behaviour as well as the provision of opportunities to the student to study the patient's illness in relation to his home and social environment. Dr. Berry asks, "Is it possible that such

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** Medical Education Today (1953)—Dr. Berry's article 'Medical education in transition'—page 99—published by the Journal of Medical Education, Association of Americal Medical Colleges, Chicago, U.S.A.

subjects as physiology, biochemistry and pharmacology, by having so much in common, can be adroitly combined in a way to permit teaching more efficiently the essential principles they contribute to medical education ?" Six Annual Teaching Institutes were laid out : —

1. Physiology, Biochemistry and Pharmacology.
2. Pathology Microbiology, Immunology and Genetics.
3. Anatomy, Histology, Embryology and Anthropology.
4. Medical Ecology.
5. Clinical Teaching including the Internship.
6. Specialty training and the Continuing Education of the Physician.

14. To indicate the extent of preparation that precedes such discussions the procedure in respect of a Conference on Preventive Medicine, which took place at Colorado Springs just before the annual meeting of the Association of American Medical Colleges in November 1952, is briefly described here. The Conference dealt with the subject under five heads, (*a*) Curriculum content and Methodology, (*b*) Departmental Inter-relationships, (*c*) Comprehensive Health Care, (*d*) Community Health Activities and (*e*) Research. A small planning committee functioned for more than a year before the Conference met in November 1952 and five committees carried out preparatory studies. Membership of the Conference included " 70 professors and teachers of preventive medicine ; 29 consultants representing a variety of organisations such as schools of public health, foundations and voluntary and official health agencies ; six consultants representing special fields such as nursing, social work and the social sciences. In addition, as an important part of the Conference, 22 deans of medical schools attended as active participants."

15. This reference to the steps that are undertaken in U.S.A. for a systematic study of the problems of medical education was made with the specific purpose of drawing attention to the desirability of the planning of medical training in India being taken up on a broader basis than that of a university or of the Medical Council of India, although each may have certain statutory responsibilities for the regulation of medical education. The convening of the present Conference is therefore of great importance and it will contribute much to future progress if it can lay down the steps that should be taken to promote periodical consultations in order to deal with different aspects of the problems. The establishment of an Association of Medical Colleges in India may prove to be useful in this connection. An appendix to this memorandum gives the composition and functions of the Association of American Medical Colleges. There are also in our country a number of associations representing specialities like Pathology, Surgery, Medicine and Obstetrics and Gynaecology. A forum at which universities, the Medical Council of India, the suggested Association of Medical Colleges and the organisations representing specialities can meet and discuss problems of medical education will prove invaluable towards the evolution of proposals which have behind them the largest measure of agreement and therefore the best chance of acceptance and implementation by the country as a whole.

Permanent Machinery for Promoting Medical Education.

16. A permanent organization for dealing with medical education should include representatives of the various interests that are actively concerned with its promotion on proper lines. The Central and State Governments should of

course be included; the latter maintain most of the medical colleges in India. Moreover, these governments are the authorities which will provide the necessary funds for improvements; they can also promote progress through appropriate legislation and such administrative measures as may be required from time to time. The Central Health Council provides opportunities for the discussion and formulation of agreed policies on matters of common concern and for facilitating the execution of those policies in the country as a whole. Universities, the Medical Council of India, the proposed Association of Medical Colleges if it comes into existence, and the more prominent among the associations relating to specialities should also be included in the suggested permanent body. The inclusion of a small number of experts on medical education selected on their own merits also seems desirable. In view of the large number of States and of Universities their inclusion in the proposed organization on the basis of grouped regional representation may have to be considered.

17. It is suggested that the Conference should consider the question of recommending the creation of a Permanent Council on Medical Education. This Council should cover, within its range of functions, the various aspects of medical education, including the organisation of studies into the training programme for medical students, the financing of such studies, the assessment of their results and the formulation of suitable recommendations to the educational authorities of the country. The Council may delegate its different activities to special committees composed of its own members and of others co-opted from outside sources.

18. The grants made available for improving medical education should be administered by this Council. It is desirable that the Council should function as an autonomous body dealing directly with the managements of medical colleges, universities and the Medical Council of India and disbursing its grants for specific purposes. The authorities concerned with the maintenance of medical teaching institutions are of a varied character, *e.g.*, State Governments, the University in respect of Lucknow Medical College and the Bombay College of Physicians and Surgeons in the case of one of the qualifications included in the First Schedule of the Indian Medical Council Act. This fact and the possibility that the funds that are made available will be a joint contribution by the Centre and the States would seem to suggest that it is appropriate to empower a Council, on which both are represented, to exercise the financial functions associated with the programme of improving medical education. The fact that the Council would function as the body for promoting studies into medical education and for assessing their results would place it in a better position than any other authority in the country to disburse the grants with discrimination and to ensure their utilisation to the best advantage. A system of tight control of the activities of Council through the Administrative and Finance Ministries of Government is to be deprecated. These Ministries will have no direct contact with the progress of medical education in the country and the control that they attempt to exercise will therefore have little of that sympathetic understanding and appreciation of vital matters, which are essential for promoting wise administration. Moreover control by the Ministries involves usually considerable delay, which should be avoided if progress is to be achieved. Such control as governments should exercise must be, in the opinion of the writer, through the scrutiny of the annual budget of the Council by the governments and through the advice and guidance that their representatives on the Council will provide during its deliberations. One of the guiding principles of democratic administration should be, it is suggested, to decentralize control to ensure

efficiency by the proper organization of the authority to which power is delegated and then to promote the growth of responsibility by providing room for unfettered action.

19. Will the acceptance of these suggestions cut across the existing functions and powers of universities and the Medical Council of India? There is no reason to believe that it would. The idea underlying the proposal is to associate universities and the Medical Council with the formulation of studies and the planning of measures for the improvement of medical education. It is therefore to be hoped that their co-operation would be secured for the execution of those measures. Where there is voluntary acceptance, the question of interference with legal rights does not arise. Universities are, in fact, more directly concerned with the matter than the Medical Council. The power vested in the Council to make grants to promote studies and to carry out improvements should prove to be a strong incentive to universities to offer active co-operation as it is their medical colleges that are benefited by these grants.

20. One of the conditions necessary for experimental studies in medical education is freedom from undue rigidity in the enforcement of curricula and methods of teaching. Here universities are directly concerned because they are responsible for these details of the training programme. They and the Medical Council of India are both interested in ensuring that such experimental studies do not result in an objectionable lowering of the standard of training. The proposed Council on Medical Education will have both universities and the Medical Council on its membership and it may therefore be expected that the research programmes that are approved and carried out would have been considered and rendered satisfactory from this point of view.

Certain Other Matters

21. ***Prohibition of Private Practice.***

It has been the tradition in India to pay the teachers in medical colleges low salaries and to permit them to supplement their income through private practice. In certain colleges these salaries are replaced by much smaller amounts which are granted as honoraria to those who serve as members of the teaching staff. In the case of the latter the justification for a vigorous pursuit of private practice is even greater. The result has been an unsatisfactory standard of teaching and neglect of research in the different departments of medical colleges. The time has arrived to consider seriously whether this state of affairs cannot be rectified. In the All-India Institute of Medical Sciences, which is being established in New Delhi, the Government of India has agreed to the payment of scales of salary which are higher than those available in other medical colleges and to the complete prohibition of private practice by all members of the teaching staff. Proposals for the reform of medical education, including the promotion of studies into the methods of teaching and of assessing periodically the progress of the student, will fail if better scales of pay are not sanctioned and prohibition of private practice is not enforced.

22. A substantial rise in expenditure as the result of giving higher salaries has been a major obstacle to the acceptance of the proposal by Governments. In the case of the All-India Institute of Medical Sciences it has been agreed that the services of the doctors and the facilities of the hospital should be made available to that section of the public which can pay for such services, through a system of pay clinics organized by the different departments, the fees charged being in accordance with a schedule approved by the Government of India.

All the money collected through the clinics goes into the funds of the Institute and not to the doctors or other members of the staff of the institution. It is expected that, in this way, a substantial part of the additional cost incurred by the Government of India through the higher scales of pay can be met.

23. The hospitals attached to medical colleges provide the best medical care available in the respective regions, because they are better equipped and staffed than other hospitals. Therefore, the introduction of the above-mentioned measures in the teaching hospitals situated in different parts of India should present little or no difficulty. Pay clinics are bound to become popular and remunerative. A substantial rise in the scales of emoluments of doctors and prohibition of private practice will have a salutary effect on medical education throughout the country. The establishment of full-time units in every department of a medical college is one of the suggestions which the Conference will consider. The proposal put forward here is an extension of the same principle to all members of the teaching staff. It seems likely that complete prohibition covering all teachers may create less troublesome problems, including resentment by the teachers at differential treatment, than the introduction of small whole-time units into individual departments.

Financial help to secure the best available talent for medical training.

24. Medicine has to compete with other professions to secure the best available talent for being trained into future physicians. Medical education is perhaps the most costly and the longest form of professional training. Even after such training the qualified physician has to put in some more years of study if he is to specialize in any particular branch of the subject and attain to the status of a consultant. Such a long period of medical education must be a great strain on the resources of middle class parents and even of the richer classes. It is not known how far the costly nature of medical education is turning away good students into other professions. It is safe to assume that intelligence, industry, character and other qualities which help to make a good medical man are not the exclusive possessions of the richer and more successful classes. In relation to the total number of admissions that are available those who apply are many times more ; this state of affairs may be creating a deceptive picture of the situation as regards the flow of suitable talent to our medical colleges. In any case the matter requires serious consideration.

25. The Bhore Committee discussed at length this problem. It recommended financial support to the medical student during his period of training, his admission into public service after he qualifies and the recovery of a part of the amount given to him in easy instalments, without interest, over a period of 10 years. Selection for admission to medical training should be based on merit as ascertained through appropriate tests. The Committee considered such a system of payment "as fair to the individual, advantageous to the community, and not too burdensome to the State." An annual provision of Rs. 1,000 per student was considered sufficient. This was ten years ago. The cost of medical education has definitely risen during this period. Even so, an annual grant of Rs. 1,000 a year to a medical student will go a long way to help him. The Committee considered the application of a means test to determine whether the parent or guardian would be able to support the student as difficult and unsatisfactory in many ways and suggested payment to all students. The only qualifying clause was that the stipend should be paid only if a guarantee was given that, at the end of his training, the student would enter public service. Those who refused to give this undertaking would not be eligible to get the

stipend. It is for consideration whether the Conference will be prepared to suggest this or some other method of attracting suitable candidates to medical education. As regards repayment a limit of 50 p.c. of the amount spent on the training of the student appears to be reasonable.

26. Under the proposal outlined in the previous paragraph the State must undertake to employ those who pass out from the medical colleges of the country if they are willing to join public service. Today no such guarantee exists and many young men, who pass out, are not utilized properly. It is in the interest of the governments and people of the country to ensure that the products of such costly training, towards which a substantial contribution comes from public funds, are made use of to full advantage. The programmes of rural and urban health care, which will certainly expand continuously as part of successive five-year plans, should be so drawn up as to ensure the absorption of all the doctors who are produced annually. They do not number in all more than about 2,000 or 2,200. India, with a population which may reach 400 millions by 1960 or 1961, should be able to absorb this number and utilize their services in full, when the Soviet Union, with perhaps only 215 or 220 millions, is creating 20,000 doctors a year or about 10 times India's annual output and is making use of them all.

The provision of field training facilities.

27. The establishment of rural and urban health organizations as integral parts of every medical college is recommended as a suggestion which the Conference may take up for serious consideration. The prospective medical practitioner should be prepared for work in urban and rural areas and should be able to perform both curative and preventive health functions. It is therefore proper to put forward the suggestion that rural and urban health centres should be provided. so that the medical student may secure adequate practical training in the performance of the duties that await him. Probably all the hospitals attached to medical colleges train nurses and midwives. In some places dental colleges also exist. These health centres can provide an integrated programme of practical training for prospective doctors, nurses and dentists. In relation to maternal and child health work and the care of school children all the three have their respective roles to perform. The midwife also plays her part in regard to domiciliary midwifery. In many other types of health programmes, *e.g.,* campaigns against tuberculosis and Venereal Diseases, the doctor and the nurse work in close collaboration. It is therefore eminently desirable that trainees of these different types should be given opportunities to work together and in a co-ordinated manner; health centres provide facilities for developing such work.

28. The need has been stressed for enabling the medical student to study the patient not only in the setting of the hospital ward or out-patient department but also in his home environment. Rural and urban health centres will provide the necessary facilities for such study.

29. Further, these health centres can be used for promoting research into the health problems of the community and for associating medical students, particularly post-graduate students, with such research. Association with research, even if it be of an elementary type, can be made a method of awaking the undergraduate student's initiative and sense of curiosity, of sharpening his powers of observation, of acquiring precision in recording those observations and of developing the ability to draw valid conclusions from them.

30. The physician of the future should develop a high sense of responsibility towards the community and an appreciation of the part he should play in promoting the welfare of the people. Early opportunities during his training period to do medical-social work in the community help to develop these qualities in him. The Professor of Preventive Medicine in one of our medical colleges, who organized such a programme and has been following it for the past several years, mentioned to the writer what a wholesome effect it has had on the medical student. He said that preoccupation solely with Anatomy, Physiology and other laboratory work tended to eliminate quickly those finer feelings of service to the community with which many a young man entered the portals of his medical college, while early contact with the people and their problems and opportunities to serve them helped to keep alive and strengthen his social outlook and the spirit of service. He said that, in his own college, he offered these opportunities to the first year students, that in the beginning only a limited number of them joined the scheme which was on a voluntary basis but that, in after years, its popularity grew rapidly. Rural and urban health centres attached to medical colleges can provide abundant scope for the development of such a programme of social education to the students.

The needs of the rural population.

31. The needs of the rural population in regard to medical care are the concern of the medical educationist in two ways. Firstly, he is directly concerned with the shaping of medical education in such a manner as to enable the future physician to meet these needs. Some of the needs were pointed out in the second chapter of the 'Résumé of the discussions of the Joint Committee on the reports of Sub-committees I, II and III on the 19th and 20th of September 1955 document Medical Education Conference VI). Secondly, the medical educationist is indirectly concerned with the proper use of the doctors he helps to produce; without such use much of the labour spent on medical education goes in vain. Today there is a considerable degree of unwillingness on the part of doctors to work in the villages; they tend to crowd in the cities and larger towns even though a substantial proportion of them may be compelled to earn an unsteady and insufficient income in an atmosphere of fierce competition. The causes responsible for this state of affairs include lack of amenities in the rural areas, inadequacy of facilities for the education of children and insufficient income from private practice. The need for a wide expansion of medical care in the rural areas continues to be insistent and it is therefore essential that the conditions for service in these areas should be improved without delay. The provision of quarters without payment and of transport facilities free of charge as well as the grant of an allowance to meet, in part, the cost of education of children, which has usually to be arranged elsewhere, will go a long way to make rural service attractive to doctors. A compensatory allowance for service in rural areas may prove to be an additional incentive to seek employment there. It is for consideration whether the Conference should recommend these and any other measures that may be deemed necessary to promote a free flow of doctors into our villages. It seems fairly certain that, without the development of such facilities, the improved system of medical education, which teachers of medicine may help to promote and maintain, will prove to be of little value in translating the fruits of their labours into actual service to the people.

Concluding remarks. ...

32. If we in India are to embark successfully on a campaign to improve our medical education and are to strive to provide a fuller and more efficient system of medical care to the people, the co-operation of all those who are concerned with the promotion of the necessary measures is essential. The conditions required for the development of such co-operation can be created and maintained only if all the agencies that are involved will keep the common purposes as the objectives to be achieved even at the expense of some surrender of their existing rights and powers. If such an attitude can be established through a process of mutual adjustment of their views, then the attainment of the targets that the country sets before itself in raising the standard of medical education will be achieved progressively and the results of such achievements will be reflected in the provision of improved health services to the people. In many ways the time is now favourable for promoting these developments. The Conference will therefore be justified in planning boldly and wisely for a re-organization of the existing system of medical education. The purpose of re-organization is to create doctors who are professionally sound and are able to provide such medical care as is best suited to the conditions of our country.

33. Love of the profession and love of the people, these two sum up in brief the qualities of a true physician. Love of the profession keeps him a diligent student all his life and equips him more and more for the efficient discharge of his duties. Love of the people illumines his mind and heart and imparts to the medical care he administers that beneficent quality which enriches the lives of the recipients and his own life too.

APPENDIX V

The Association of American Medical Colleges.

(Taken from their 1955 Directory)

The Association of American Medical Colleges was founded in 1876 and re-organized in 1890. It is dedicated to the advancement and improvement of medical education.

Until recently membership was limited to schools of medicine that conformed to the requirements as specified in the By-Laws of the Association. At the 64th Annual Meeting in October 1953, the Association's Constitution and By-Laws were amended to make possible individual membership and sustaining membership.

There now are four classes of membership open to individuals, institutions and agencies conforming to the requirements of the Association :

(1) *Institutional* membership for medical schools or colleges in the United States.

(2) *Affiliate institutional* membership for medical schools or colleges in Canada or present or former possessions of the United States.

(3) *Individual* membership.

(4) *Sustaining* membership for individuals, institutions and/or agencies.

The Association is directed by an Executive Council composed of six elected members, two of whom are elected annually for three year terms ; incumbent officers ; the immediate past president and the secretary and director of studies. Most Association projects are directed by standing committees, appointed annually, upon which representatives of member institutions serve.

The Association carries on a wide variety of activities concerned with improving and advancing medical education:

Education and Advisory Service. This programme of medical college visitation is carried out in co-operation with the Council on Medical education and Hospitals of the American Medical Association. Its purpose is to maintain and improve the high standards of American medical education. The periodic visitations to schools are made when the institutions are in full operation.

Statistics and Records. The director of studies of the Association maintains on punched cards records of applicants to medical schools and progress records of students in medical schools. A roster of teaching personnel also is maintained.

The Journal of Medical Education. The Journal is the official publication of the Association and the only magazine devoted exclusively to the field of medical education. Each of its monthly issues contains articles of interest to medical educators, editorials and comments, audio-visual news, book reviews, general and college news, etc

The medical Audio-Visual Institute. The Institute serves as a center of study and advancement of audio-visual materials in medical education. During 1955 some of its activities will include: development of a film exchange for the

medical schools; study of classroom and staff-room physical design and operation; supply of motion picture card data to the Library of Congress; development of preview circuits and film publication programmes; supply of selected information to the Audio-visual News section of the Journal of Medical Education.

The Annual Meeting. Each fall the Association sponsors a three-day conference for medical educators. Seminar sessions, discussion periods and lectures give meeting participants an opportunity to learn how others have solved some of the complex problems of medical education and administration. Reports and recommendations of Association committees are read and discussed, new officers are elected and the annual Borden Award in the Medical Sciences is presented. The time and place of the 1955 meeting are October 24-26, New Ocean House, Swampscott, Mass.

Teaching Institutes. In 1953 the Association conducted the first of the Teaching Institute planned in conjunction with the Annual Meeting for the next six years. Each year the Institute will center around some particular field of medical education. October 19 through 22, 1955, the teaching of anatomy, and anthropology will be the subjects of discussion in the New Ocean House, Swampscott, Mass. Attendance at the institute is by invitation only.

The Medical College Admission Test. Offered through the Educational Testing Service of Princeton, N.J., the test is given to almost all students applying for entrance into American medical colleges. Permanent records of all tests are maintained at Association headquarters and are available to medical schools upon request.

The National Intern Matching Programme. The Association, as an active participant in the co-operative matching plan for internship appointments (formerly the National Inter Association Committee on Internships), has helped to develop the matching programme, under which prospective interns and participating hospitals are matched as closely as possible according to mutual preference. Mechanics of the programme are handled in the Association's central office.

Other organizations participating in the programme are: American Hospital Association, American Protestant Hospital Association, Catholic Hospital Association, Council on Medical Education and Hospitals of the American Medical Association, and the medical services of all federal agencies offering internships.

Publications The Association publishes helpful and useful information for educators and students throughout the year. A partial list of these publications may be found on the inside back cover of the Directory.

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